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ABSTRACT

This document provides computer programs, written in BASIC PLUS, for presenting fundamental or remedial college chemistry students with chemical problems in a computer assisted instructional program. Programs include instructions, a sample run, and 14 separate practice sessions covering: mathematical operations, using decimals, solving proportions, metric conversion, using metric, word problems, balancing chemical equations, stoichiometry, gas laws, and solutions. (SL)

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MAY, 1977

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PROGRAMS FOR

FUNDAMENTALS OF CHEMISTRY

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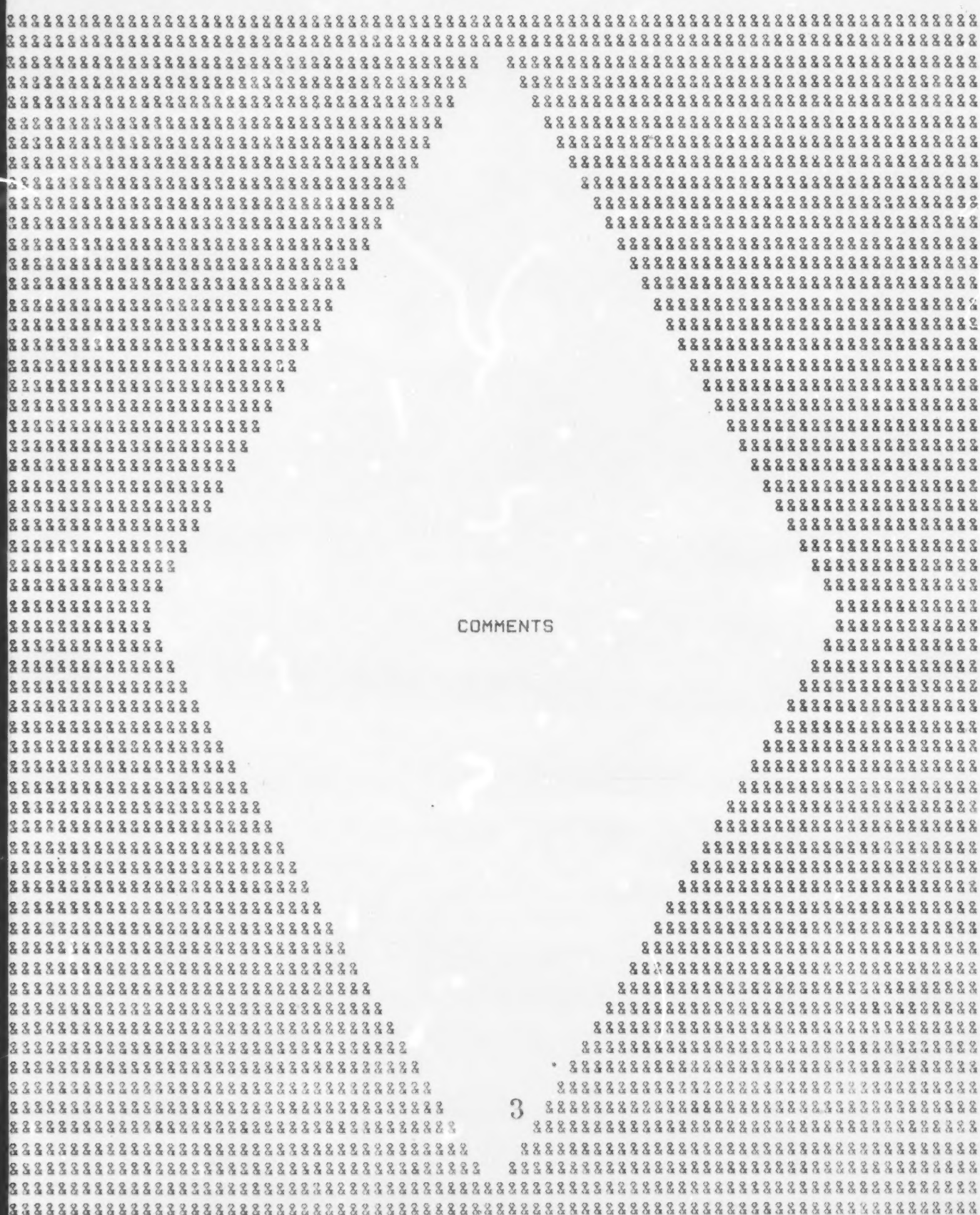
HOSTOS COMM. COLLEGE

SE 022 653


COMMENTS

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COMMENTS

I - ALL PROGRAMS IN THIS PACKAGE ARE TO BE USED BY ANY STUDENT TAKING A FUNDAMENTALS OR REMEDIAL COURSE IN CHEMISTRY

II - ALL TERMINALS SHOULD BE SET WITH THE FOLLOWING CHARACTERSTICS USING THE 'TTYSET' COMMANDS:

A - WIDTH 81

B - LC OUTPUT

III - ALL PROBLEMS HAVE BEEN WRITTEN IN BASIC PLUS LANGUAGE. THESE PROGRAMS CANNOT BE RUN ON A COMPUTER THAT DOSEN'T HAVE A BASIC PLUS COMPILER. IT SHOULD BE NOTED THAT IN ALMOST ALL CASES, ANY DATA GIVEN IS RANDOMIZED. THEREFORE NO TWO RUNS OF THE SAME PROGRAM WILL CONTAIN THE SAME DATA.

IV - EACH PROGRAM, WHEN RUN, WILL PRINT 'CODE #?'. THIS IS FOR THE INSTRUCTORS USE ONLY. THE POSSIBLE RESPONCES TO THIS ARE:

A - PRESS #1 FOLLOWED BY<CR>; THIS WILL CAUSE THE COMPUTER TO PRINT OUT JUST THE PROBLEMS CONTAINED WITHIN THE PROGRAM. THIS MEANS THAT THE COMPUTER WILL NOT WAIT FOR THE STUDENT'S ANSWER. FOLLOWING THE PROBLEMS THE CORRECT ANSWERS WILL BE PRINTED OUT. THIS IS INTENDED FOR THE INSTRUCTORS USE ONLY. OUR AIM WAS THAT THESE QUESTIONS COULD BE USED AS A TEST OR HOMEWORK ASSIGNMENTS.

B - WHEN ANY OTHER CHARACTER IS PRESSED FOLLOWED BY THE <CR> ALL PROGRAMS WILL FOLLOW THE SAME PATTERN. THAT IS, IT WILL ASK FOR THE STUDENT'S NAME AND ID# BEFORE PROCEEDING TO THE PROBLEMS THEMSELVES. THE PROGRAM WILL NOW BE IN A 'PRACTICE SESSION' MODE (SEE V).

V - PRACTICE SESSION MODE

A - WHEN THE PROGRAM IS RUN IN THIS MODE THE STUDENT WILL BE ASKED TO SOLVE A SET OF PROBLEMS.

****

B - THERE IS NO SET TIME LIMIT FOR THE STUDENT TO COMPLETE THE SESSION OR TO SOLVE THE PROBLEMS. HOWEVER, THE STUDENTS ARE GIVEN TWO CHANCES TO ANSWER A QUESTION CORRECTLY. AFTER THE SECOND INCORRECT ANSWER THE COMPUTER WILL PRINT OUT THE CORRECT NUMERICAL ANSWER BUT WILL NOT SHOW THE STEPS USED TO ARRIVE AT THAT ANSWER

C - THE COMPUTER WILL KEEP A RECORD OF ALL CORRECT ANSWERS BUT WILL NOT INDICATE IF THE CORRECT ANSWER WAS OBTAINED IN THE FIRST OR SECOND TRY.

D - AT THE END OF A SESSION THE COMPUTER WILL PRINT OUT ALL OF THE CORRECT ANSWERS AND THE STUDENT ANSWERS.

VI - WHEN WE STARTED THIS TASK OF WRITING PROGRAMS TO BE USED AS PRACTICE SESSIONS BY THE STUDENTS IN SEPT. 1976, WE DID NOT HAVE ANY KNOWLEDGE OF COMPUTER PROGRAMMING.

THIS CAN BE SEEN IN THE PROGRAMS THEMSELVES, THAT HAVE A LOW DEGREE OF SOPHISTICATION. AS TIME PROGRESSED, AND WE LEARNED MORE TECHNIQUES IN PROGRAMMING, THE SOPHISTICATION OF THE PROGRAMS INCREASED, ALTHOUGH WE THOUGHT THAT THE STRUCTURE OF THE PROGRAMS SHOULD BE KEPT STRAIGHT FOWARD AND SIMPLE ENOUGH SO ANYBODY WITH SOME KNOWLEDGE OF BASIC PLUS LANGUAGE COULD FOLLOW WHAT WAS DONE. OUR AIM WAS TO LEARN ENOUGH COMPUTING KNOWLEDGE TO BE ABLE TO DEVELOPE PROGRAMS THAT STUDENTS COULD BENEFIT FROM

VII - FINAL COMMENTS:

THIS PACKAGE WAS DEVELOPED BY DR. JULIO GALLARDO AND MR. STEVEN DELGADO OF THE PHYSICAL SCIENCE DEPT. OF HOSTOS COMMUNITY COLLEGE OF C.U.N.Y.

IN OUR LAST EDITING WE HAVE TRIED TO ERASE ALL MISTAKES, BUT AS USUALLY HAPPENS, MANY OF THEM MAY HAVE ESCAPED OUR SCRUTINY.

ANY COMMENTS, SUGGESTIONS OR CORRECTIONS THAT YOU MAY HAVE ABOUT THIS PACKAGE MAY BE SENT TO:

DR. JULIO GALLARDO
OR
MR. STEVEN DELGADO
PHYSICAL SCIENCE DEPT.
HOSTOS COMMUNITY COLLEGE
475 GRAND CONCOURSE
BRONX, NEW YORK 10451

FINALLY WE WOULD LIKE TO THANK DR. A. MURIEL FOR GIVING US THE CHANCE TO BE PARTICIPANTS IN THIS PROJECT.

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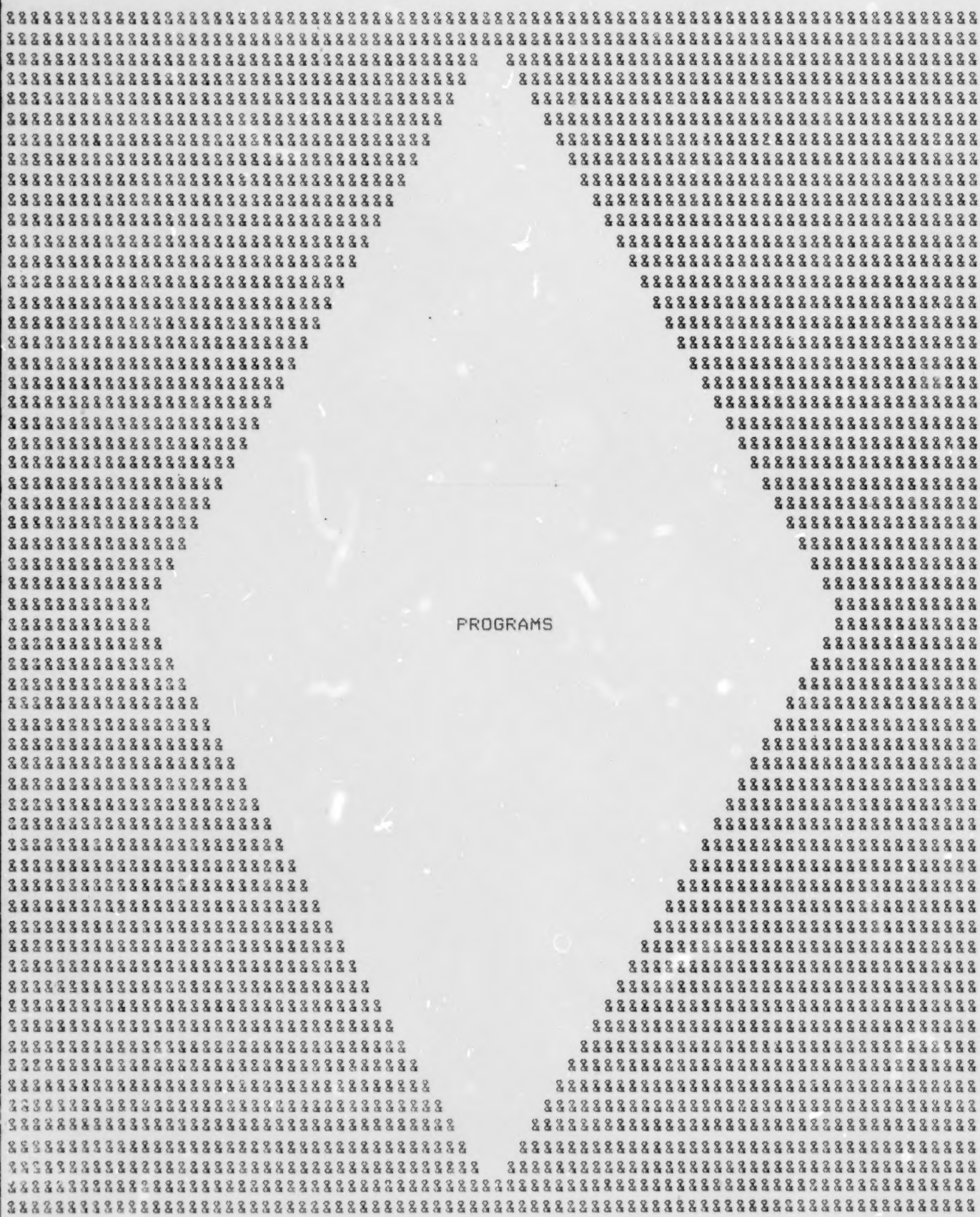
FILE NAME	DESCRIPTION
INST	INSTRUCTIONS FOR USING ALL PROGRAMS IN THIS PACKAGE. FROM HERE A STUDENT CAN CHOOSE ANY TOPIC HE WISHES TO DO.
CHE008	A PRACTICE SESSION USING INTERGERS WITH VARIOUS MATHEMATICAL OPERATIONS (ADD., SUB., MULT., AND DIV.). THIS SESSION CONSISTS OF 12 PROBLEMS.
CHE108	A PRACTICE SESSION USING DECIMALS WITH VARIOUS MATHEMATICAL OPERATIONS. THIS SESSION HAS 15 PROBLEMS.
CHE208	A PRACTICE SESSION IN SOLVING PROPORTIONS AND PERCENTAGE PROBLEMS. THIS SESSION HAS 16 PROBLEMS.
CHE308	A PRACTICE SESSION IN CONVERTING FROM THE METRIC SYSTEM TO THE ENGLISH SYSTEM AND VISA VERSA. THIS SESSION HAS 15 PROBLEMS.
CHE408	A PRACTICE SESSION USING THE METRIC SYSTEM IN WORD PROBLEMS. THIS SESSION HAS 10 QUESTIONS.
CHE508	A PRACTICE SESSION ON WORD PROBLEMS, USING ALL OF THE ABOVE INFORMATION. HERE A STUDENT CAN CHOOSE THE NUMBER OF PROBLEMS HE WISHES TO DO. THIS SESSION HAS 14 QUESTIONS.
CHE608	THESE ARE THE INSTRUCTIONS TO BE USED BEFORE THE STUDENT ANSWERS THE QUESTIONS ON BALANCING CHEMICAL EQUATIONS. THIS PROGRAM RANDOMLY CHAINS TO ANY ONE OF 4 PROGRAMS ON BALANCING EQUATIONS (EQUAT 2,3,4 OR 5).
EQUAT 2-5	THESE ARE THE PROGRAMS CHAINED TO CHE 608. THEY EACH HAVE 10 DIFFERENT EQUATIONS. THEY CAN EACH RUN ON AN INDIVIDUAL BASIS BUT ARE NOT CHAINED TO THE 'INST' FILE.

FILE NAME	DESCRIPTION
CHE708	A PRACTICE SESSION ON STOICHIOMETRY, ASKING THE STUDENT TO ANSWER 5 QUESTIONS WHICH HAVE A LOW DEGREE OF DIFFICULTY. FROM HERE THE STUDENT CAN CHOOSE TO CONTINUE TO 10 MORE QUESTIONS (CHE718) WHICH ARE OF GREATER DIFFICULTY, OR END THE SESSION.
CHE718	THIS IS A CONTINUATION OF CHE708 BUT WITH HARDER PROBLEMS. THIS PROGRAM CAN RUN ON ITS OWN BUT IS NOT CHAINED TO THE 'INST' FILE.
CHE808	A PRACTICE SESSION ON THE GAS LAWS. CONTAINING 15 QUESTIONS OF MODERATE DIFFICULTY. THE STUDENT CAN CHOOSE TO DO 5, 10 OR ALL 15 PROBLEMS.
CHE908	A PRACTICE SESSION ON SOLUTIONS, CONSISTING OF 15 QUESTIONS DEALING WITH MOLALITY AND PERCENT SOLUTION. THE STUDENT CAN CHOOSE TO DO 5, 10 OR ALL 15 PROBLEMS.
CHE018	A PRACTICE SESSION ON SOLUTIONS (II), CONSISTING OF 15 QUESTIONS, DEALING WITH NORMALITY AND MOLARITY. THE STUDENT CAN CHOOSE 5, 10 OR ALL 15 QUESTIONS TO ANSWER.
CHE028	A PRACTICE SESSION ON THE GAS LAWS (II), CONSISTING OF 15 QUESTIONS OF GREATER DIFFICULTY THEN CHE808. A STUDENT CAN CHOOSE 5, 10 OR 15 QUESTIONS OR CANGO ON TO AN ADDITIONAL 5, 10 OR 15 QUESTIONS IN CHE038.
CHE038	THIS IS A CONTINUATION OF CHE028. THIS PROGRAM IS CHAINED TO CHE028. EACH OF THESE PROGRAMS ARE DEARED TO THE GENERAL CHEMISTRY STUDENT, BUT MAY BE USED BY THE STUDENT TAKING A FUNDAMENTALS OF CHEMISTRY COURSE. THIS PROGRAM IS NOT CHAINED TO THE 'INST' FILE.
SAMPLE	THIS IS A SAMPLE RUN OF CHE508. IT WILL SHOW HOW THE PROGRAM WILL RUN AND ALSO HOW IT CAN FUNCTION AS A SAMPLE TEST FOR THE INSTRUCTOR TO USE.

RUNNH



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INST    10:13           18-Apr-77
5 REM - THIS PROGRAM SHOULD RUN WITH THE TERMINAL SET AT "WIDTH 81".
10 ! THIS PROGRAM PRINTS INSTRUCTIONS.
15 ! THIS PROGRAM HAS BEEN PREPARED BY DR. JULIO GALLARDO AND MR. STEVEN
16 ! DELGADO OF THE PHYSICAL SCIENCE DEPT. OF HOSTOS COMMUNITY COLLEGE, AND IS
17 ! BEING SUBSIDIZED BY A GRANT FROM THE NATIONAL SCIENCE FOUNDATION.*********
19 PRINT\PRINT\PRINT
50 PRINT "THE FOLLOWING PRACTICE SESSIONS HAVE BEEN PREPARED FOR YOUR USE. BE-"
51 PRINT "FORE YOU START, PLEASE READ ALL INSTRUCTIONS CAREFULLY. MAKE SURE"
52 PRINT "THAT YOU UNDERSTAND THEM COMPLETELY, BEFORE YOU ATTEMPT TO SOLVE ANY"
53 PRINT "OF THE PROBLEMS THAT WILL BE PRESENTED. IF IN DOUBT, ASK THE INSTRUC-"
54 PRINT "TOR FOR ASSISTANCE."\PRINT\PRINT
60 SLEEP 25
65 PRINT "THE COMPUTER WILL PRINT PROBLEMS OR QUESTIONS ONE AT A TIME, AND IT"
66 PRINT "WILL WAIT FOR YOUR ANSWER BEFORE PROCEEDING. YOU WILL BE ALLOWED TWO"
67 PRINT "CHANCES TO COME UP WITH THE CORRECT ANSWER. IF YOU GIVE AN INCORRECT"
68 PRINT "ANSWER, THE COMPUTER WILL TELL YOU SO, AND WILL PRINT THE SAME PROB-"
69 PRINT "LEM AGAIN. IF YOU ANSWER INCORRECTLY A SECOND TIME THE COMPUTER WILL"
70 PRINT "PRINT THE CORRECT ANSWER AND WILL PROCEED TO THE NEXT PROBLEM. OF"
71 PRINT "COURSE IF YOUR FIRST ANSWER IS CORRECT THEN THE COMPUTER WILL AUTO-"
72 PRINT "MATICALLY PROCEED TO THE NEXT PROBLEM."\PRINT
73 PRINT "*****IN CASE OF AN INCORRECT ANSWER WE SUGGEST THAT YOU CHECK YOUR"
74 PRINT "CALCULATIONS FOR MISTAKES IN YOUR OPERATIONS. ALSO CHECK THAT THE"
75 PRINT "NUMBERS YOU HAVE ARE THE SAME AS THOSE GIVEN BY THE COMPUTER."
76 PRINT\PRINT
85 PRINT "*****IT IS BELIEVED THAT THESE EXERCISES WILL HELP TO IMPROVE YOUR"
86 PRINT "SKILLS AND ALSO IMPROVE YOUR GRADES. REMEMBER THAT THESE ARE PRACTICE"
87 PRINT "SESSIONS AND ARE NOT EXAMS, THEREFORE, YOU WILL NOT RECEIVE ANY"
88 PRINT "GRADE. THEY WILL TELL YOU WHAT YOUR WEAK AREAS ARE AND WILL HELP YOU"
89 PRINT "TO IMPROVE THEM."\PRINT\PRINT
95 PRINT "*****YOU WILL NOT BE ALLOWED TO USE CALCULATORS DURING THESE PRACTICE"
96 PRINT "SESSIONS. PAPER WILL BE PROVIDED FOR YOU TO DO ALL NECESSARY CALCU-"
97 PRINT "LATIONS. THIS PAPER(S) SHOULD BE HANDED IN AT THE END OF THE SESSION"
98 PRINT "SO THAT YOUR INSTRUCTOR CAN CHECK ON YOUR PROGRESS OR IMPROVEMENT AND"
99 PRINT "MAKE POSSIBLE SUGGESTIONS AS TO THE NEXT STEPS YOU SHOULD FOLLOW."
100 PRINT\PRINT\PRINT\PRINT
110 SLEEP 35
120 PRINT "HERE ARE SOME HELPFUL HINTS, THAT WILL ENABLE YOU TO OPERATE THE"
121 PRINT "COMPUTER WITH A MINIMUM OF DIFFICULTY."\PRINT\PRINT
122 PRINT "1-**DO NOT TYPE IN ANY INFORMATION THAT THE COMPUTER DOESN'T ASK FOR."
123 PRINT\PRINT
125 PRINT "2-**WHEN TYPING THE INFORMATION REQUESTED BY THE COMPUTER, DO IT"
126 PRINT "SLOWLY. IF YOU DO NOT KNOW HOW TO TYPE, JUST PRESS LIGHTLY ON THE"
127 PRINT "KEY(S) THAT YOU WANT, ONE BY ONE."\PRINT\PRINT
130 PRINT "3-**AFTER YOU TYPE IN THE INFORMATION REQUESTED OR YOUR ANSWERS TO"
131 PRINT "THE PROBLEMS, ALWAYS PRESS THE <RETURN> KEY. THIS WAY THE COMPUTER"
132 PRINT "KNOWS THAT YOU HAVE FINISHED ANSWERING."\PRINT\PRINT
134 PRINT "4-**ALWAYS ROUND OFF YOUR ANSWERS TO THE SECOND DECIMAL (EXCEPT IF"
135 PRINT "YOU ARE PRACTICING WITH INTEGERS, WHERE NO DECIMALS ARE REQUIRED)."
136 PRINT\PRINT
137 PRINT "******  EXAMPLE:"\PRINT
138 PRINT TAB(18)"IF YOUR ANSWER IS 15.4526  THEN TYPE  15.46  "\PRINT
139 PRINT TAB(18)"IF YOUR ANSWER IS  12.002  THEN TYPE  12.01  "\PRINT
140 PRINT TAB(18)"IF YOUR ANSWER IS  0.0001  THEN TYPE  0.00  "\PRINT
144 PRINT\PRINT
145 PRINT "THE FOLLOWING TOPICS ARE READY FOR YOUR USE:"\PRINT\PRINT
146 PRINT TAB (37)"TOPICS"
147 PRINT TAB(37)"****** "
149 PRINT\PRINT
150 PRINT TAB(0)"1- INTEGERS";TAB(40)"7- METRIC SYSTEM II"\PRINT
151 PRINT TAB(0)"2- DECIMALS";TAB(40)"8- STOICHIOMETRY"\PRINT
152 PRINT TAB(0)"3- PROPORTIONS & DECIMALS";TAB(40)"9- GAS LAWS I"\PRINT
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153 PRINT TAB(0)"4- WORD PROBLEMS";TAB(40)"10-SOLUTIONS I"\PRINT
154 PRINT TAB(0)"5- BALANCING EQUATIONS";TAB(40)"11- SOLUTIONS II"\PRINT
155 PRINT TAB(0)"6- METRIC SYSTEM I";TAB(40)"12- GAS LAWS II"\PRINT\PRINT\PRINT
160 PRINT "CHOOSE THE PRACTICE SESSION THAT YOU WANT BY TYPING THE TOPIC NUMBER"
161 PRINT "AFTER THE QUESTION MARK (?).**********************************"
162 PRINT
165 INPUT "WHICH TOPIC NUMBER WOULD YOU LIKE ";N
170 IF N=1 THEN CHAIN"CHE008" ELSE IF N=2 THEN CHAIN"CHE108" ELSE IF N=3 THEN CHA
IN"CHE208" ELSE IF N=4 THEN CHAIN"CHE508" ELSE IF N=5 THEN CHAIN"CHE608"
175 IF N=6 THEN CHAIN"CHE308" ELSE  IF N=7 THEN CHAIN"CHE408" ELSE IF N=8 THEN CH
AIN"CHE708"ELSE IF N=9 THEN CHAIN "CHE808" ELSE IF N=10 THEN CHAIN"CHE908"
180 IF N=11 THEN CHAIN"CHE018" ELSE IF N=12 THEN CHAIN"CHE028"
200 END
```

```
CHE008  10:01            18-Apr-77
1 REM - THIS IS A PROGRAM USED TO PRACTICE VARIOUS MATHEMATICAL OPERATIONS WITH I
NTERGERS.
2 ! THIS PROGRAM WAS DEVELOPED BY DR. JULIO GALLARDO , OF HOSTOS COMMUNITY COLLEG
E, PHYSICAL SCIENCE DEPT., AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCIENC
E FOUNDATION.....................
4 DIM A(15),B(15)
5 INPUT "CODE # "; N9%
6 IF N9% = 1 THEN 50
9 PRINT\PRINT
10 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME. "; A1$
11 PRINT
12 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER. ";A2$
13 PRINT
14 PRINT " YOUR NAME IS, " A1$ ", AND YOUR SOCIAL SECURITY NUMBER IS, "
15 PRINT
16 PRINT A2$ ", ARE THEY CORRECT?  TYPE 'Y' FOR YES OR 'N' FOR NO. ";
18 INPUT A3$\PRINT
19 IF A3$ = "Y" THEN 50
20 IF A3$= "N" THEN 10 ELSE PRINT " USE 'Y' OR 'N' ONLY!!!!!! "\PRINT
21 GO TO 10
50 FOR Z = 1 TO 12
52 IF Y > Z1 THEN 3000
55 RANDOMIZE
56 R1=RND(Z)+1\R2=RND(Z)+1\R3=RND(Z)+1\R4=RND(Z)+1
57 X1=INT(R1*125)\X2=INT(R2*225)\X3=INT(R3*175)\X4=INT(R4*325)
58 X5=X1+X2\X6=X1+X2+X3\X7=X1+X2+X3+X4\X8=X1*X2\X9=X1*X2*X3
59 Y1=X1*X2*X3*X4\Y2=X5*X6
60 M9%=0\PRINT\PRINT
61 M9%=M9%+1%\FOR H%= 10% TO 25%\IF M9%>2% THEN 65 ELSE PRINT TAB(H%) "*";\NEXT H
%
62 PRINT TAB(25) "*"\IF M9%=2 THEN 65 ELSE PRINT TAB(10%) "*";TAB(14%) "PROBLEM";
\PRINT Z;\PRINT TAB(26%) "*"\GOTO 61
63 C1=0
65 C1=0\PRINT
70 PRINT
100 IF Z=1 THEN PRINT X1"+"X2"=" \A(1)=X1+X2
105 IF Z = 2 THEN PRINT X1"+"X2"+"X3"=" \A(2)=X1+X2+X3
110 IF Z = 3 THEN PRINT X5"-"X1"=" \A(3)=X5-X1
115 IF Z = 4 THEN PRINT X6"-"X1"=" \A(4)=X6-X1
120 IF Z = 5 THEN PRINT X5"+"X6"-"X1"-"X2"=" \A(5)=X5 +X6-X1-X2
125 IF Z = 6 THEN PRINT X8"+"X5"-"X6"=" \A(6)=X8+X5-X6
130 IF Z = 7 THEN PRINT X1"X"X2"=" \ A(7)=X1*X2
135 IF Z = 8 THEN PRINT X1"X"X2"X"X3"=" \A(8)=X1*X2*X3
140 IF Z = 9 THEN PRINT X8"/"X1"=" \A (9)=X8/X1
145 IF Z = 10 THEN PRINT X8"/"X2"=" \A(10)=X8/X2
146 IF Z = 11 THEN PRINT "(" X1"X"X2"X"X3") / "X8 \ A(11)=(X1*X2*X3)/X8
150 IF Z = 12 THEN PRINT "(" X8"X"Y2")/("X1"X"X2"X"X5")=" \A(12)=(X8*Y2)/(X1*X2*X
5)
151 IF N9%=1 THEN 163
154 PRINT
160 INPUT " YOUR ANSWER IS ----------> ";B(Z)
161 PRINT
162 IF A(Z)<> B(Z) THEN 200 ELSE PRINT "CORRECT!!! " \S=S+1
163 PRINT\PRINT
170 NEXT Z
171 IF Z = 12 GOTO 3001
200 C1=C1+1
201 IF C1=1 THEN PRINT "YOU ARE INCORRECT.  PLEASE TRY AGAIN. "\PRINT\GOTO160
202 PRINT  " YOU ARE WRONG AGAIN.  THE CORRECT ANSWER IS ----------" A(Z)
203 PRINT\PRINT
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```
3000 GO TO 170
3001 PRINT
3003 IF I%% = 1 THEN 3013
3006 INPUT XX\ PRINT\PRINT
3007 PRINT A1$ "; HAS COMPLETED THIS SESSION."
3008 PRINT
3009 PRINT A1$ "; HAS ANSWERED **** " S " **** QUESTIONS CORRECTLY, AND ****  "
3010 PRINT
3011  PRINT Z-S; " **** QUESTIONS INCORRECTLY, HERE ARE THE CORRECT ANSWERS;"\PRI
NT
3012 PRINT " AND "; A1$ "'S ANSWERS. "
3013 PRINT\PRINT\PRINT\PRINT\PRINT\PRINT\PRINT\PRINT\PRINT\PRINT
3014 PRINT TAB(2) "PROBLEM";TAB(15) "CORRECT ANSWER";TAB(35) "STUDENT'S ANSWER"
3015 PRINT TAB(2) "*******";TAB(15) "**************";TAB(35)"**********"\PR
INT\PRINT
3016 FOR Z = 1 TO 12
3018  PRINT TAB(2) " " Z;TAB(17)""A(Z);TAB(38)"" B(Z)
3019 NEXT Z
4000 END
```

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CHE108  10:08            18-Apr-77
1 REM THIS IS A PRACTICE SESSION IN DECIMALS.
2 ! THIS PROGRAM WAS DEVELOPED BY DR. JULIO GALLARDO OF HOSTOS COMMUNITY COLLEGE.
 AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCIENCE FOUNDATION.............
.....................................
3 DIM A(20),B(20)
5 INPUT "CODE # "; N1%\PRINT\PRINT\PRINT
7  IF N1% = 1 THEN 49
9 PRINT
10 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME. ";A1$
11 PRINT
14 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER. ";A2$
15 PRINT
20 PRINT " YOUR NAME IS, "A1$; ", AND YOUR SOCIAL SECURITY NUMBER"\PRINT
21 PRINT " IS, "A2$ ". ARE THEY CORRECT? TYPE 'Y' FOR YES AND 'N' FOR NO."
22 INPUT A3$
25 IF A3$="N" THEN 9
26 IF A3$<>"Y" THEN PRINT\PRINT " TYPE 'Y' OR 'N' ONLY!!!!"\PRINT\GOTO 20
27 PRINT
49  FOR Z = 1 TO 15
50  RANDOMIZE
51 R1=RND(Z)+1\R2=RND(0)+1\R3=RND(1)+1\R4=RND(0)+1
52 X1=(INT(R1*1225))/10\X2=(INT(R2*888))/10
53 X3=(INT(R3*125))/100\X4=(INT(R4*225))/100
54 X5=(INT(R1*175))/1000\X6=(INT(R2*455))/1000
55 X7=(INT(R3*7777))/1000000\X8=(INT(R4*8545))/100000
56 Y1=X1+X2\Y2=X1+X2+X3\Y3=X3*X4\Y4=X4*X5
57 Y5=X7*X8
70 M9%=0\PRINT\PRINT
71 M9%=M9%+1%\FOR H%=15% TO 30%\IF M9%>2 THEN 75 ELSE PRINT TAB(H%) "*";\NEXT H%
72 PRINT TAB (31%) "*"\IF M9%=2% THEN 75 ELSE PRINT TAB(15%)"*";TAB(19%) "PROBLEM
";\PRINT Z;\PRINT TAB(31%) "*"\GOTO 71
73 PRINT
75 PRINT\PRINT
99 C1=0
100 IF Z=1 THEN PRINT X1"+"X2"="\A(1)=Y1
101 IF Z =2 THEN PRINT X1"+"X2"+"X3"="\A(2)=Y2
102 IF Z=4 THEN PRINT X1"+"X3"+"X4"+"X5"="\A(4)=X1+X3+X4+X5
103 IF Z=3 THEN PRINT X1"+" X3"+"X2"=" \A(3)=Y2
104 IF Z=5 THEN PRINT Y1"-"X1"="\A(5)=Y1-X1
105 IF Z=6 THEN PRINT X1+X7+X8"-"X7"="\A(6)=X1+X7+X8-X7
106 IF Z=7 THEN PRINT Y2"-"X3"="\A(7)=Y2-X3
107 IF Z=8 THEN PRINT X7+X8+X3"+"X2"-"X3"-"X7"="\A(8)=X8+X2
108 IF Z=9 THEN PRINT X1"X"X2"="\A(9)=X1*X2
109 IF Z=10 THEN PRINT X1"X"X2"="\A(10)=X1*X2
110 IF Z=11 THEN PRINT X1"X"X3"X"X4"="\A(11)=X1*X3*X4
111 IF Z=12 THEN PRINT Y3"/"X3"="\A(12)=Y3/X3
112 IF Z=13 THEN PRINT X7"X"X8"="\A(13)=X7*X8
113 IF Z=14 THEN PRINT Y4"/"X4"="\A(14)=Y4/X4
114 IF Z=15 THEN PRINT Y4"/"X5"="\A(15)=Y4/X5
115 PRINT
116 IF N1%=1 THEN 125
120 PRINT\INPUT "   YOUR ANSWER IS ----------------------> ";B(Z)
121 IF ABS(A(Z)-B(Z))>.01 THEN 400 ELSE PRINT " CORRECT!!! "\PRINT
125 NEXT Z
126 IF Z=15  THEN 445
400 C1=C1+1\PRINT\IF C1=1 THEN PRINT " YOU ARE INCORRECT, TRY AGAIN. " ELSE PRINT
 " YOU ARE WRONG AGAIN. THE CORRECT ANSWER IS ----------> ";
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```
401 IF C1=1 THEN 120
402 PRINT USING " $$###.## " A(Z) \GOTO 125
445 IF N1%=1 THEN 490
450 PRINT " THE STUDENT ";A1$ ", HAS COMPLETED THIS SESSION."\PRINT
452 PRINT A1$ ", HAS ANSWERED " S " QUESTIONS CORRECTLY. "\PRINT
454 PRINT " HERE ARE THE CORRECT ANSWERS AND " A1$  "'S ANSWERS: "
490 PRINT TAB(3)"PROBLEM";TAB(15)"CORRECT ANSWER";TAB(35)"STUDENT ANSWER"
491 PRINT TAB(3)"*******";TAB(15)"**************";TAB(35)"**************"\PRINT
500 FOR Z = 1 TO 15
501 IF Z<10 THEN PRINT TAB(5)''Z; ELSE PRINT TAB(4)''Z;
502 PRINT USING "       #####.## " A(Z);
503 PRINT TAB(38)''B(Z)\NEXT Z
2000 END
```

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CHE208  10:03            19-Apr-77
1 REM - THIS PROGRAM IS USED TO PRACTICE HOW TO SOLVE PROPORTIONS AND HOW TO SOLV
E SIMPLE PERCENT PROBLEMS.
2 ! THIS PROGRAM WAS DEVELOPED BY DR. JULIO GALLARDO, OF HOSTOS COMMUNITY COLLEGE
, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCIENCE FOUNDATION.
4 PRINT\PRINT
5 DIM A(20), B(20)
6 INPUT "CODE # "; N1%\IF N1%=1 THEN 50
7 PRINT\PRINT\PRINT
10 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME. ";A1$
11 PRINT
12 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER. "; A2$
13 PRINT
14 PRINT " YOUR NAME IS, " A1$ ", AND YOUR SOCIAL SECURITY NUMBER IS, "\PRINT
15 PRINT A2$ ", ARE THEY CORRECT?  TYPE 'Y' FOR YES OR 'N' FOR NO. ";
17 INPUT A3$ \PRINT
18 IF A3$ = "Y" THEN 50 ELSE IF A3$= "N" THEN 10 ELSE PRINT " USE 'Y' OR 'N' ONLY
!!!! "\PRINT\GOTO10
50 FOR Z = 1 TO 16
52 RANDOMIZE
53 R1 = RND(Z)+1\R2=RND(0)+1\R3=RND(0)+1\R4=RND(0)+1
54 X1=(INT(450*R1))/100\X2=(INT(750*R2))/100\X3=(INT(545*R3))/100
55 X4=(INT(560*R4))/100\X5=(X1*X4)/(X2*X3)
56 X6=(INT(1250*R1))/100\X7=(INT(1350*R2))/100\X8=(INT(1450*R3))/100\PRINT
57 M9%=0\PRINT \PRINT
58 C1=0
59 M9%=M9%+1\FOR H%=20% TO 36%\IF M9%>2% THEN 65 ELSE PRINT TAB(H%) "*";\NEXT H%
60 PRINT TAB(37%) "*"\IF M9%=2 THEN 65 ELSE PRINT TAB(20%) "*";TAB(24%) "PROBLEM"
;\PRINT Z;\PRINT TAB(37) "*" \GOTO 58
65 PRINT\PRINT
100 IF Z = 1 THEN PRINT "X :"X2";:"X3";:"X4 \A(1)=(X2*X3)/X4
102 IF Z = 2 THEN PRINT X1" : X;:"X2";:"X3 \A(2)=(X1*X3)/X2
103 IF Z = 3 THEN PRINT X1";:"X2";: X :"X3 \A(3)=X1*X3/X2
104 IF Z= = 4 THEN PRINT X1";:"X2";:"X3";: X " \A(4)=X2*X3/X1
105 IF Z = 5 THEN PRINT "X ! "X1";:"X2";:"X3 \A(5)=X1*X2/X3
106 IF Z = 6 THEN PRINT X1";:"X2";: X;"X3 \A(6)=(X1*X3)/X2
107 IF Z = 7 THEN PRINT "X /"X1 "="X2"/"X3 \A(7)=(X1*X2)/X3
108 IF Z = 8 THEN PRINT X1"/X = " X2"/"X3 \A(8)=(X1*X3)/X2
109 IF Z = 9 THEN PRINT X1"/"X2 "=X /"X3 \A(9)=(X1*X3)/X2
110 IF Z = 10 THEN PRINT X1"/"X2"="X3"/ X" \A(10)=X2*X3/X1
111 IF Z = 11 THEN PRINT X6 " IS "X7 "% OF WHAT NUMBER?" \A(11)=X6*100/X7
112 IF Z = 12 THEN PRINT X1 "IS " INT(Z*X1) "% OF WHAT NUMBER? "\A(12)=X1*100/(IN
T(Z*X1))
113 IF Z = 13 THEN PRINT X6" IS WHAT PERCENT OF "X7 \A(13)=X6*100/X7
114 IF Z = 14 THEN PRINT X6 "IS WHAT PERCENT OF " X7 \ A(14)=X6*100/X7
115 IF Z = 15 THEN PRINT "WHAT IS "X8"% OF " X7 "?" \A(15)=X8*X7/100
116 IF Z = 16 THEN PRINT "WHAT IS  "X8"% OF  "X7"?" \A(16)=X8*X7/100
120 PRINT
130 IF N1%) = 1 THEN 300
150 IF Z<= 10 THEN PRINT " WHAT IS THE VALUE OF X "; ELSE PRINT " YOUR ANSWER IS
200 INPUT B(Z)\PRINT
210 IF ABS(A(Z)-B(Z))> .01 THEN 400 ELSE PRINT " CORRECT!!! "\PRINT
300 PRINT
310 Z=Z
320 IF Z = 16 THEN 50
330 STOP
400 IF C1=1 THEN PRINT " YOU ARE INCORRECT! TRY AGAIN. " ELSE PRINT " YOU ARE WR
ONG!!!  THE CORRECT ANSWER IS "A(Z)
410 IF C1=1 THEN 420 ELSE PRINT " ----------"
420 PRINT USING 430, A(Z)
430 IMAGE ####.##
440 C1=1 \GOTO 200
```

```
1000 PRINT\PRINT
1001 PRINT A$ " HAS COMPLETED THIS SESSION. "\PRINT
1002 PRINT A1$ " HAS ANSWERED " S " PROBLEMS CORRECTLY. "\PRINT
1003 PRINT\PRINT " HERE ARE THE CORRECT ANSWERS AND " A1$ "'S ANSWERS: "
1004 PRINT
1005 PRINT TAB(3)"PROBLEM";TAB(15)"CORRECT ANSWER";TAB(40)"STUDENT ANSWER"
1006 PRINT TAB(3)"*******";TAB(15)"**************";TAB(40)"**************"
1007 FOR Z = 1 TO 16 \PRINT
1008   IF Z < 10 THEN PRINT TAB(5)''Z;ELSE PRINT TAB(4)''Z;
1009 PRINT USING '       ####.##' A(Z);
1010 PRINT TAB(45)''B(Z)\NEXT Z
2000 END

Ready
```

```
CHE308  09:40              18-APR-77
1 REM - THIS IS A PRACTICE SESSION IN THE METRIC SYSTEM.>>>>>>>>>>>>
2 ! THIS PROGRAM HAS BEEN DEVELOPED BY DR. JULIO GALLARDO, OF HOSTOS COM
MUNITY COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCIENCE
FOUNDATION>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
5 DIM A(20),B(20)
6 INPUT " CODE # "; N1%\PRINT\PRINT\PRINT
7 IF N1% = 1 THEN 50
8 PRINT\PRINT " YOU MUST GIVE YOUR ANSWERS TO THREE DECIMAL PLACES."
9 PRINT " ********************************************** "\PRINT\PR
INT
10 INPUT "AFTER THE QUESTION MARK (?), TYPE YOUR NAME. ";A1$
14 PRINT\ INPUT "AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY
NUMBER. ";A2$
15 PRINT
20 PRINT " YOUR NAME IS, ";A1$;" , AND YOUR SOCIAL SECURITY NUMBER '\PRI
NT
21 PRINT "IS, "A2$ ". ARE THEY CORRECT?  TYPE 'Y' FOR YES AND 'N' FOR NO
. ";
22 INPUT A3$ \PRINT
25 IF A3$ = "N" THEN 10,
26 IF A3$<>"Y" THEN PRINT "TYPE 'Y' OR 'N' ONLY!!!!" \PRINT\GOTO 20
50 RANDOMIZE
51 FOR Z=1 TO 15
52 R1=RND(Z)+1
53 X1= (INT(2560*R1))/100\X2=(INT(1345*R1))/100
54 C1=0
55 IF X1=0 THEN 52
56 IF X2=0 THEN 52
87 PRINT\PRINT "
88 IF Z<10 THEN PRINT "          ********** " ELSE PRINT "          ****
****** "
89 PRINT "          PROBLEM " Z
90 IF Z<10 THEN PRINT "          ********** " ELSE PRINT "          ****
****** "
95 PRINT\PRINT
100 IF Z = 1 THEN PRINT "HOW MANY METERS IN " X1 "CENTIMETERS? "\A(1)=X1
/100
105  IF Z=2 THEN PRINT" HOW MANY CENTIMETERS IN " X1 "KILOMETERS?" \A(2)
=X1*100000
110 IF Z=3 THEN PRINT " HOW MANY MILLIMETERS IN " X1 " METERS? "\A(3)=X1
*1000
115 IF Z=4 THEN PRINT " HOW MANY KILOMETERS IN " X1 " DECIMETERS? "\A(4)
=X1 * .0001
120 IF Z=5 THEN PRINT " HOW MANY METERS IN " X1 " MILLIMETERS? "\A(5) =
X1/1000
125 IF Z=6 THEN PRINT " HOW MANY FT IN " X1 " IN. ? "\A(6)=X1/12
130 IF Z =7 THEN PRINT " HOW MANY MILES IN " X2 " FT. ? "\A(7)=X2/5280
135 IF Z=8 THEN PRINT " HOW MANY INCHES IN " X1 " MILES? "\A(8)=X1*5280
140 IF Z=9 THEN PRINT " HOW MANY MILLILITERS IN " X1 " LITERS? "\A(9)= X
1*1000
145 IF Z=10 THEN PRINT " HOW MANY LBS. IN " X2 " GRAMS? "\A(10)=X2/454
150 IF Z=11 THEN PRINT " HOW MANY LITERS IN " X1 " QUARTS? "\A(11)=X1/1.
06
155 IF Z=12 THEN PRINT " HOW MANY CENTIMETERS IN " X1 " INCHES? "\A(12)=
X1*2.54
160 IF Z=13 THEN PRINT " HOW MANY GALLONS IN " X1 " KILOLITERS? "\A(13)=
(X1*1060)/4
165 IF Z=14 THEN PRINT " HOW MANY KILOGRAMS IN " X2 " LBS. ? "\A(14) = X
2*.454
170 IF Z=15 THEN PRINT " HOW MANY MILLIMETERS IN " X1 " MILES?" \A(15)=X
1*5280*304.8
179 IF N1%=1 THEN 200
180 PRINT\INPUT "YOUR ANSWER ---------------------> ";B(Z)\PRINT
```

```
181 IF ABS(A(Z)-B(Z)) > .001 THEN 1000 ELSE PRINT "CORRECT!!!!"
182 S=S+1\IF Z= 15 THEN 499
200 NEXT Z
499 IF N1%=1 THEN 514
500  PRINT " YOUR SESSION HAS ENDED. PLEASE CALL YOUR INSTRUCTOR. "\PRIN
T
501 INPUT K%
502 PRINT
503 PRINT "   THE STUDENT " A1$ ", HAS COMPLETED THIS SESSION. "\PRINT
504 PRINT A1$ ", HAS ANSWERED  " S " QUESTIONS CORRECTLY. "\PRINT
505 PRINT\PRINT\PRINT " HERE ARE THE CORRECT ANSWERS AND "A1$ "'S ANSWER
S." \PRINT
506 GOTO 515
514 PRINT\PRINT\PRINT\PRINT\PRINT\PRINT\PRINT\PRINT\PRINT\PRINT
515 PRINT TAB(5) "PROBLEM";TAB(18) "CORRECT ANSWERS";TAB(40) "STUDENT'S
ANSWER"
516 PRINT TAB(5)"*******";TAB(18)"***************";TAB(40)"************
***"\PRINT
517 FOR Z=1 TO 15 \IF Z<10 THEN PRINT TAB(6) ''Z; ELSE PRINT TAB(5) ''Z;
518 PRINT TAB(20)''A(Z);
519 PRINT TAB(42)''B(Z)
520 NEXTZ
521 GOTO 2000
1000 C1=C1+1
1001 IF C1=1 THEN PRINT " YOU ARE INCORRECT, TRY AGAIN." ELSE PRINT " YO
U ARE WRONG AGAIN.  THE CORRECT ANSWER IS ----------> ";
1002 IF C1=2 THEN PRINT USING "########.###", A(Z)
1005 IF C1=1 THEN 180 ELSE 200
2000 END

READY
```

```
CHE408  09:50            18-APR-77
5 REM- THIS IS A MORE DIFFICULT PRACTICE SESSION IN THE METRIC SYSTEM.
6 ! THIS PROGRAM WAS DEVELOPED BY DR. JULIO GALLARDO AND MR. STEVEN DELG
ADO OF HOSTOS COMMUNITY COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE
NATIONAL SCIENCE FOUNDATION.**********
11  INPUT " CODE # "; N1%\PRINT\PRINT\PRINT
12 IF N1% =1 THEN 50
15 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME. ";A1$
16 PRINT\INPUT " AFTER THE QUESTION MARK(?), TYPE YOUR SOCIAL SECURITY N
UMBER. ";A2$\PRINT
20 PRINT " YOUR NAME IS, ";A1$; ", AND YOUR SOCIAL SECURITY NUMBER "\PRI
NT
21 PRINT " IS, "A2$ ". ARE THEY CORRECT?  TYPE 'Y' FOR YES OR 'N' FOR NO
. ";
22 INPUT A3$\PRINT
25 IF A3$ = "N" THEN15
26 IF A3$<> "Y" THEN PRINT " TYPE 'Y' OR 'N' ONLY!!!! "\PRINT\GOTO 20
50 FOR Z=1 TO 10
51 RANDOMIZE
53 X1=(INT((65*RND+30)*100))/100\X2=(INT((19*RND+1)*100))/100
54 X3=(INT((19*RND+1)*100))/100\X4=(INT((19*RND+1)*100))/100
55 X5=(INT((9*RND+1)*1000))/1000
56 X6=(INT(X1*X2*100))/100\X7=(INT(X1*X2/10,9728))/100
57 PRINT
60 PRINT " PROBLEM "Z
61 PRINT " *******  ** "\PRINT
65 C1=0
100 IF Z=1 THEN PRINT "A CAR MOVES WITH A SPEED OF " X1 "KM/HR. EXPRESS
 THIS SPEED IN M/SEC. "\ A(1)= X1*1000/3600
101 IF Z=2 THEN PRINT " THE DENSITY OF AN OBJECT IS " X5 "G/ML. WHAT IS
ITS DENSITY IN LB/GAL.? "\A(2)=X5* 4000/(454*1.06)
103 IF Z=3 THEN PRINT " HOW MANY FT/SEC ARE THERE IN " X6 "M/HR? "\A(3)=
X7
104 IF Z=4 THEN PRINT " A BOX HAS THE DIMENSIONS " X2"CM X "X3 "FT X "X4
 "IN. "
105 IF Z=4 THEN PRINT " CALCULATE ITS VOLUME IN CUBIC CENTIMETERS. "\A(4
)=X2*X3*X4*30.48*2.54
106 IF Z=5 THEN PRINT " A MAN WALKS, "X6 "METERS, " 645*X7 "YARDS, "875*
X1 "FEET AND " X5 " CENTIMETERS. HOW MANY MILES DID HE WALK? "
107 IF Z=5 THEN A(5)=X6/1600 + X7*645/1760 +875*X1/5280 +X5/160000
110 IF Z= 6 THEN PRINT " YOU HAVE A " X1 "GALLON FISH TANK, AND YOU USE
A " X2 "LITER CONTAINER TO FILL IT. HOW MANY OF THESE CONTAINERS WILL IT
 TAKE? "
111 IF Z=6 THEN A(6) = (X1*3.77)/X2
115 IF Z=7 THEN PRINT " IF A LIQUID HAS A DENSITY OF " X5 "G/ML, AND YOU
 HAVE " X1 "LB OF THE SAME LIQUID. HOW MANY GALLONS DO YOU HAVE? "
116 IF Z=7 THEN A(7) = X1*.12/X5
120 IF Z=8 THEN PRINT " IF CAR 1 IS TRAVELLING AT " 4*X2 "M/SEC, AND CAR
 2 IS TRAVELLING AT " X1 "MI/HR, AND THEY ARE GOING A DISTANCE OF "X5 "K
M, WHICH WILL BE THE FIRST TO ARRIVE? "
122 IF Z=8 THEN IF 4*X2*9/4 > X1 THEN A(8)=1% ELSE A(8)=2%
125 IF Z=9 THEN PRINT " HOW MANY SECONDS WILL IT TAKE A CAR TRAVELLING A
T "X3 "MPH, TO COVER A DISTANCE OF "X1 "KM? "\A(9)= (X1*2250)/X3
130 IF Z=10 THEN PRINT "YOU HAVE A LIQUID WITH A DENSITY OF "X5 "G/ML, A
ND A CONTAINER WITH A CAPACITY OF " X2 "CUBIC FEET. "
131 IF Z=10 THEN PRINT " HOW MANY KILOGRAMS OF THIS LIQUID WILL FILL THE
 CONTAINER? "\A(10)= X5*X2*28.3169
175  IF N1%=1 THEN 200
179 PRINT
180 PRINT\INPUT "   YOUR ANSWER ----------------------> ";B(Z)\PRINT
185 IF ABS(A(Z)-B(Z)) > .04 THEN 1000 ELSE PRINT " CORRECT!!!!! "
190 S=S+1\IF Z=10 THEN 500
200 NEXT Z
475 IF N1%=1 THEN 520
```

```
500 PRINT " YOUR PRACTICE SESSION HAS ENDED. PLEASE CALL YOUR INSTRUCTOR
. "\PRINT
501 INPUT K%
503 PRINT \ PRINT
505 PRINT " THE STUDENT " A1$ ", HAS COMPLETED THIS SESSION. "\PRINT
506 PRINT A1$ ", HAS ANSWERED  " S " QUESTIONS CORRECTLY. "\PRINT
509 PRINT\PRINT\PRINT\PRINT\PRINT
510 PRINT " HERE ARE THE CORRECT ANSWERS AND " A1$ "'S ANSWERS. "\PRINT
520 PRINT\PRINT\PRINT\PRINT\PRINT\PRINT\PRINT
530  PRINT  TAB(6) "PROBLEM";TAB (20)"CORRECT ANSWERS";TAB(45) "STUDENT'
S ANSWER"
535  PRINT TAB(6; "*******"; TAB(20) "***************";TAB(45)"*********
*******"
536 PRINT
540  FOR Z=1 TO 10\ PRINT TAB(8)''Z;
541 F$="######.##"
542 PRINT TAB(22) " ";\ PRINT USING F$, A(Z);
550 PRINT TAB(48)''B(Z)
560 NEXT Z
570 GO TO 2000
1000 C1=C1+1\PRINT
1005 IF C1=1 THEN PRINT "YOU ARE INCORRECT, TRY AGAIN. " ELSE PRINT  " Y
OU ARE WRONG AGAIN. THE CORRECT ANSWER IS  ----------> ";
1006 IF C1=1 THEN 180 ELSE IF Z=8 THEN PRINT "CAR # " A(8) ELSE PRINT US
ING "######.##" , A(Z);
1007 IF Z=1 THEN PRINT " M/SEC" ELSE IF Z=2 THEN PRINT " LB/GAL" ELSE IF
 Z=3 THEN PRINT " FT/SEC" ELSE IF Z=4 THEN PRINT " C.C." ELSE IF Z=5 THE
N PRINT " MILES " ELSE IF Z=6 THEN PRINT " CONTAINERS"
1008 IF Z=7 THEN PRINT " GALLONS" ELSE IF Z=9 THEN PRINT " SEC. " ELSE I
F Z=10 THEN PRINT " KILOGRAMS "
1009 PRINT
1010 IF C1=1 THEN 100 ELSE 200
2000 END

READY
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CHE508  13:03            19-Apr-77
1 REM - THIS IS A PRACTICE SESSION ON WORD PROBLEMS. >>>>>>>>>>>>>>>>>>>>>>>>
2 ! THIS PROGRAM HAS BEEN PREPARED BY DR. JULIO GALLARDO, OF HOSTOS COMMUNITY
    COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCIENCE FOUNDATION.
5 INPUT "          CODE # "; M%
6 PRINT\PRINT
10 IF M%=1 THEN 39
11 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME. "; A1$
12 PRINT\ INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER.
";A2$\PRINT
13 PRINT " YOUR NAME IS, "; A1$; ", AND YOUR SOCIAL SECURITY NUMBER "\PRINT
14 PRINT " IS, " A2$ ". ARE THEY CORRECT?  TYPE 'Y' FOR YES AND 'N' FOR NO. ";
15 INPUT A3$ \PRINT
16 IF A3$="N" THEN 11
17 IF A3$<> "Y" THEN PRINT " TYPE 'Y' OR 'N' ONLY !!!!! "\PRINT\GOTO 13
39 INPUT " HOW MANY PROBLEMS DO YOU WANT "; N
40 F$ = "######.##"
48 DIM A(25),B(25)
50 IF L=0 THEN51 ELSE IF L=1 THEN 52 ELSE IF L=2 THEN 53ELSE IF L=3 THEN 54
51 FOR Z=1 TO N \GOTO55
52 FOR Z1=N+1 TO N+B%\GOTO 55
53 FOR Z2= N+1+B% TO N+B%+C%\GOTO 55
54 FOR Z3= N+1+B%+C% TO N+B%+C%+D%
55 RANDOMIZE
60 X1=(INT(100*(9*RND +1)))/100 \X2=(INT(100*(9*RND +1)))/100
65 X3=(INT(100*(70*RND +20)))/100\X4=(INT(100*(65*RND +15)))/100
66 X5=(INT(100*(499*RND +500)))/100\X6=(INT(100*(1000*RND +1000)))/100
67 X1%=INT(X2)\X7=(INT(100*(5*RND +15)))/100\X8=(INT(100*(20*RND +15)))/100
69 C1=0\PRINT\PRINT\PRINT
70 IF Z<10 THEN PRINT TAB (15) "********** " ELSE PRINT TAB(15) "********** "
71 PRINT TAB(15) "PROBLEM " Z
72 IF Z<10 THEN PRINT TAB(15) "**********"  ELSE PRINT TAB(15) "**********"
73 PRINT\PRINT
100  IF Z<> 1 THEN 110 ELSE PRINT " A BRASS BAR WEIGHING " X4 "LBS IS MADE OF " X
3 "% ZINC AND THE BALANCE OF "
101 PRINT "COPPER. HOW MANY LBS. OF COPPER DOES IT CONTAIN? "
102 A(1)=X4 - ((X3*X4)/100)
110 IF Z<>2 THEN 120 ELSE PRINT " A TRUCK CARRYING " X5 " LBS OF COAL WEIGHED " X
6 " LBS. "
111 PRINT "WHAT PERCENT OF THE TOTAL WEIGHT WAS DUE TO THE WEIGHT OF THE TRUCK? "
112 A(2)=(100*(X6-X5))/X6
120 IF Z<>3 THEN 130 ELSE PRINT " HOW MANY SHEETS OF METAL 1/" X1% " INCHES THICK
 ARE THERE IN A PILE " X4 " INCHES "
121 PRINT "HIGH? "
122 A(3)= X4*X1%
130 IF Z<>4 THEN 140 ELSE PRINT " A ROOF IS TILED AT A COST OF $" X1 " PER SQUARE
 FOOT. IF THE ROOF MEASURE " X3 " X " X4 " FEET, WHAT IS THE COST OF THE JOB? "
132  A(4) =INT(100*X1*X3*X4)/100
140 IF Z<>5 THEN 150 ELSE PRINT " AN OBJECT MOVES " X4 " FEET EVERY " X2 " SECOND
S. HOW MANY FEET WOULD IT TRAVEL AFTER " X1 " HOURS? "
142 A(5)=(3600*X1*X4)/X2
150 IF Z<>6 THEN 160 ELSE PRINT " IF AN AUTOMOBILE RUNS " X3 " MILES ON " X2 " GA
LLONS OF GAS, HOW FAR WOULD IT"
151 PRINT "GO ON A FULL " X7 " GALLONS TANK? "
152 A(6)= (INT(100*X3*X7/X2+5))/100
160 IF Z<>7 THEN 170 ELSE PRINT " IF A POLE " X7 " FEET HIGH CASTS A SHADOW " X1
" FEET LONG, HOW LONG A SHADOW "
161 PRINT "WOULD, A " X8 " FEET HIGH POLE, CAST? "
162 A(7)=(INT(100*X1*X8/X7))/100
170 IF Z<> 8 THEN 190 ELSE PRINT "" X5 " LITERS OF A LIQUID, HAVE A WEIGHT OF " X
8 " LBS.  HOW MANY LBS OF THE "
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171 PRINT "LIQUID WOULD BE USED IN AN EXPERIMENT THAT CALLS FOR " X4 " LITERS? "
172 A(8)= (INT(100*X8*X4/X5))/100
190 IF Z<>9 THEN 200 ELSE PRINT " A BAR, " X1 " METER LONG, WEIGHS " X2 "GRAMS. H
OW MANY GRAMS WOULD, A SIMILAR "
191 PRINT  "BAR " X3 " METER LONG, WEIGH? "
192 A(9)=(INT( 100*X2*X3/X1))/100
200 IF Z<>10 THEN 210 ELSE PRINT " A TRAIN MAKES A TRIP IN " X8 " HOURS TRAVELLIN
G AT A SPEED OF " X7 " MPH.IF A"
201 PRINT "SECOND TRAIN, MAKES THE SAME TRIP IN " X4" HOURS, HOW FAST DOES "
202 PRINT "IT MOVES? "\A(10)=(INT(100*X8*X4/X7))/100
210 IF Z<>11 THEN 215 ELSE PRINT " A SUBSTANCE IS COMPOSED OF " X2 " GRAMS OF HYD
ROGEN, "X3 " GRAMS OF SULFUR"
211 PRINT "AND "X5 " GRAMS OF OXYGEN. WHAT IS THE PERCENT OF OXYGEN FOUND IN THE
"
212 PRINT "SUBSTANCE? "\A(11)=(INT(100*(X5*100)/(X2+X3+X5)))/100
215 IF Z<>12 THEN 220 ELSE PRINT " IN THE FOLLOWING FORMULA, D= ATG, D HAS THE VA
LUE " X1 ", T HAS THE VALUE " X2" AND"
216 PRINT "G HAS THE VALUE " X3 ". WHAT IS THE VALUE OF A? "\ A(12)=X1/(X2*X3)
220 IF Z<>13 THEN 225 ELSE PRINT " A SUGAR SOLUTION IS PREPARED MIXING " X3 " MIL
LILITERS OF WATER AND " X4 " GRAMS OF SUGAR"
221 PRINT "HOW MANY GRAMS OF SUGAR SHOULD BE MIXED WITH " X2 " MILLILITERS OF WAT
ER, TO "
222 PRINT  "OBTAIN A SIMILAR SOLUTION? " \A(13)=(X4*X2)/X3
225 IF Z<>14 THEN 230 ELSE PRINT " THE COST OF A 3 LBS BAG OF COFFEE WAS $" X1 "
LAST MONTH. TODAY THE SAME BAG"
226 PRINT "COST $" X2 ". WHAT WAS THE PERCENT INCREASE PER LBS OF COFFEE? "\A(14)
=(X2-X1)*100/X1
230 IF M%=1 THEN 297
231 PRINT\PRINT
250 INPUT " YOUR ANSWER  ----------->  "; B(Z)
252 IF ABS(A(Z)-B(Z))>.02 THEN 498 ELSE PRINT\PRINT\PRINT "          CORRECT!!! "
253  S1=S1+1
295 IF Z=N+B%+C%+D% THEN 2015
297 IFL=0 THEN 304 ELSE IF L=1 THEN 303 ELSE IF L=2 THEN 302 ELSE IF L=3 THEN 301
301 Z=Z+1\NEXT Z3
302 Z=Z+1\NEXT Z2
303 Z=Z+1\NEXT Z1
304 NEXT Z
497 GOTO 2015
498 PRINT
500 C1=C1+1\IF C1=1 THEN PRINT " YOU ARE INCORRECT. TRY AGAIN. " ELSE PRINT " YOU
 ARE WRONG AGAIN. THE CORRECT ANSWER IS --------> ";
502 IF C1=1 THEN 230
503 PRINT USING F$, A(Z)
505 GOTO 297
1500 GOTO 2000
1990 IF M%=1 THEN 1994 ELSE PRINT " THE STUDENT " A1$ ", HAS ENDED THIS SESSION.
"\PRINT
1991 PRINT A1$ ", HAS ANSWERED " S1 ", QUESTIONS CORRECTLY. "
1992 PRINT
1993 PRINT " HERE ARE " A1$ "'S ANSWERS AND THE CORRECT ANSWERS. "
1994 PRINT\PRINT\PRINT\PRINT
2000 PRINT TAB(3) "PROBLEM";TAB(15) "CORRECT ANSWER";TAB(35) "STUDENT ANSWER"
2001 PRINT TAB(3)"*******";TAB(15)"**************";TAB(35)"**************"
2002 PRINT\PRINT
2005 FOR Z=1 TO N + B% + C% + D%
2007 PRINT TAB( 6)''Z;
2009 PRINT TAB (18)''A(Z);
2010 PRINT TAB(39) ''B(Z)
2014 NEXT Z
2015 L=L+1\PRINT\PRINT
2016 IF Q$ = "NO" THEN 3000
2020 INPUT " DO YOU WANT MORE PROBLEMS "; Q$
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```
2021 PRINT\PRINT
2030  IF Q$="YES" THEN 2031 ELSE 1990
2031IF L=1 THEN Z=Z+1 ELSE IF L=3 THEN Z=Z-1
2032 IF L=1 THEN 2038 ELSE IF L=2 THEN 2040 ELSE IF L=3 THEN 2042 ELSE IF L=4 THE
N 3000
2038 INPUT "HOW MANY PROBLEMS "; B%\GOTO 52
2040 INPUT " HOW MANY PROBLEMS ";C%\GOTO 53
2042 INPUT " HOW MANY PROBLEMS ";D%\GOTO 54
2050 GOTO 55
3000 END
```

```
CHE608  10:33            18-Apr-77
1 ! THIS IS A PRACTICE SESSION IN BALANCING CHEMICAL EQUATIONS. **********
**********************************************************************
2 REM THIS PROGRAM WAS DEVELOPED BY DR. JULIO GALLARDO AND MR. STEVEN DELGADO , O
F HOSTOS COMMUNITY COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCIEN
CE FOUNDATION.........................
3 PRINT\PRINT\PRINT
5 PRINT "     THE COMPUTER WILL PRINT AN UNBALANCED CHEMICAL EQUATION."\PRINT
6 PRINT "YOU WILL TYPE IN YOUR ANSWER AFTER THE QUESTION MARK (?)."\PRINT\PRINT\P
RINT
7 PRINT "     YOUR ANSWER SHOULD BE TYPED IN USING THE FORM '1,9,6,7,ETC. '. YOUR
"
8 PRINT "ANSWER SHOULD INCLUDE ANY COEFFICIENTS THAT MAY BE EQUAL TO ONE,"
9 PRINT "EVEN THOUGH THIS IS USUALLY NOT DONE.**********************************
"
10 PRINT\PRINT\PRINT
11 FOR I = 1 TO 7\PRINT TAB(5+I) "*";\NEXT I
12 PRINT\PRINT TAB(6)"EXAMPLE"
13 FOR I = 1 TO 7 \PRINT TAB(5+I) "*";\NEXT I
14 PRINT\PRINT\PRINT
15 PRINT TAB(12) "HCl  +  NaOH  ----->  NaCl  +  H O"\PRINT TAB(43)"2"\PRINT\PRINT
16 PRINT "YOUR ANSWER WILL LOOK LIKE THIS: "\PRINT
17 PRINT TAB(32) "-------------------> 1,1,1,1 "\PRINT\PRINT\PRINT
18 PRINT "     IF YOU SHOULD ANSWER ANY QUESTION WRONG TWICE, THE COMPUTER WILL"
19 PRINT "TYPE OUT THE CORRECT ANSWER AND ALSO THE BALANCED EQUATION. HOWEVER, "
20 PRINT "THE COMPUTER WILL PRINT THE BALANCED EQUATION ONLY WITH COEFFICIENTS"
21 PRINT "GREATER THAN '1'......................................................"
22 PRINT\PRINT\PRINT
30 RANDOMIZE
90 RANDOMIZE
95 S%= INT(3*RND+1%)
96 PRINT S%
102 IF S%=1 THEN CHAIN "EQUAT2" ELSE IF S%=2 THEN CHAIN "EQUAT3" ELSE IF S%=3 THE
N CHAIN "EQUAT4" ELSE IF S%=4 THEN CHAIN "EQUAT5"
1000 END

Ready
```

```
EQUAT2  12:09            18-Apr-77
1 REM- THIS IS A PRACTICE SESSION IN BALANCING CHEMICAL EQUATIONS.,
2 ! THIS PROGRAM HAS BEEN DEVELOPED BY DR. JULIO GALLARDO, AND MR. STEVEN DELGADO
, OF HOSTOS COMMUNITY COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SC
IENCE FOUNDATION.
3 PRINT\PRINT\PRINT
4 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME. ";A1$\PRINT
5 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER. "; A2$\P
RINT
6 PRINT " YOUR NAME IS, " A1$; ", AND YOUR SOCIAL SECURITY NUMBER "\PRINT
7 PRINT " IS, " A2$ ", ARE THEY CORRECT? TYPE 'Y' FOR YES OR 'N' FOR NO. ";
8 INPUT A3$ \PRINT
9 IF A3$ = "N" THEN 3
10 IF A3$<> "Y" THEN PRINT " TYPE 'Y' OR 'N' ONLY!!!!!" \PRINT \GOTO6
59 DIM A$(10,10)\DIM B$(10,10)\DIM C$(10,10)
65 D$(1,1)=" 2,1,2 "\D$(2,1)=" 1,3,2 "\D$(3,1)=" 4,11,2,8 "\D$(4,1)=" 2,2,3 "\D$(
5,1)=" 3,2,3,2,4 "
67 D$(1,2)=" 2,1,1,2 "\D$(2,2)= " 1,4,1"\D$(3,2)=" 1,1,1,4 "\D$(4,2)=" 2,2,2,1,4
"\D$(5,2)=" 2,15,10,12 "
99 A1$ = " CORRECT!!! "\B1$ = " WHAT ARE THE CORRECT COEFFICIENTS "
100 A$(1,1)=" H    +   O    ----->   H O"
101 B$(1,1)="  2        2           2  "
102 A$(2,1)=" N    +   H    ----->   NH "
103 B$(2,1)="  2        2           3 "
104 A$(3,1)=" FeS   +    O   ----->   Fe O   +   SO "
105 B$(3,1)="    2        2           2 3       2"
106 A$(4,1)=" KC1O   ----->   KC1  +   O "
107 B$(4,1)="     3                    2"
108 A$(5,1)=" H S  +   HNO   ----->   S  +   NO  +   H O"
109 B$(5,1)="  2          3                          2"
115 A$(1,2)=" NaCl  +   H SO   ----->   Na SO   +   HCl"
116 B$(1,2)="              2 4             2  4 "
117 A$(2,2)=" Ni  +   CO  ----->   Ni(CO) "
118 B$(2,2)="                        4"
119 A$(3,2)=" (NH ) Cr O   ----->   N   +   Cr O   +   H O"
120 B$(3,2)="    4 2  2 7          2        2 3       2"
121 A$(4,2)=" KrF   +   H O  ----->   Kr  +   O   +   HF"
122 B$(4,2)="    2        2                 2        "
123 A$(5,2)=" C H  OH  +    O   ----->    CO   +    H O"
124 B$(5,2)="  5 11           2              2        2"
300 C$(1,1)="2H   +   O   ----->  2H O "
301 C$(2,1)=" N   +  3H   ----->  2NH "
302 C$(3,1)="4FeS   +  11O   ----->  2Fe O   +  8SO "
303 C$(4,1)="2KC1O   ----->  2KC1  +  3O "
304 C$(5,1)="3H S  +  2HNO   ----->  3S  +  2NO  +  4H O "
310 C$(1,2)="2NaCl  +   H SO   ----->   Na SO   +  2HCl "
311 C$(2,2)=" Ni  +  4CO  ----->   Ni(CO) "
312 C$(3,2)=" (NH ) Cr O   ----->   N   +   Cr O   +  4H O "
313 C$(4,2)="2KrF   +  2H O  ----->  2Kr  +   O   +  4HF "
314 C$(5,2)="2C H  OH  +  15O   ----->  10CO   +  12H O "
400 RANDOMIZE\I=(INT(4%RND +1.5))\C1=0
401 IF Z1=1 THEN IF I=V% THEN 400
402 IF Z1=2 THEN IF I=V% THEN 400 ELSE IF V1%=I THEN 400
403 IF Z1=3 THEN IF I=V% THEN 400 ELSE IF V1%=I THEN 400 ELSE IF V2%=I THEN 400
404 IF Z1=4 THEN IF I=V% THEN 400 ELSE IF V1%=I THEN 400 ELSE IF I=V2% THEN 400 E
LSE IF I= V3% THEN 400
405 IF Z1=5 THEN IF I=V% THEN 400 ELSE IF I=V1% THEN 400 ELSE IF I=V2% THEN 400 E
LSE IF I=V3% THEN 400 ELSE IF I=V4% THEN 400
406 FOR J=1 TO 2\Q1=Q1+1\PRINT\PRINT "  PROBLEM " Q1\IF Q1<10 THEN PRINT "  *****
**  *" ELSE PRINT "  *******  **"
407 PRINT\PRINT A$(I,J)\PRINT B$(I,J)\PRINT\PRINT B1$;
408 IF K%=1 THEN 803
410 IF J=1 THEN IF I=3 THEN 470 ELSE IF I=5 THEN 480 ELSE 460
412 IF J=2 THEN IF I=2 THEN 460 ELSE IF I=4 THEN 480 ELSE 470
```

```
460 INPUT'';N%,M%,P%
461 GOTO 500
470 INPUT'';N%,M%,P%,Q%
471 GOTO 510
480 INPUT'';N%,M%,P%,Q%,R%
481 GOTO 520
500 IF J=1 THEN IF I=1 THEN 503 ELSE IF I=2 THEN 505 ELSE IF I=4 THEN 507
501 IF J=2 THEN IF I=2 THEN 509
503  IF N%<>2 THEN 800 ELSE IF M%<>1 THEN 800 ELSE IF P% <>2 THEN 800 ELSE GOTO90
0
505 IF N%<>1 THEN 800 ELSE IF M%<>3 THEN 800 ELSE IF P% <>2 THEN 800 ELSE 900
507 IF N%<>2 THEN 800 ELSE IF M%<>2 THEN 800 ELSE IF P%<>3 THEN 800 ELSE 900
509 IF N%<>1 THEN 800 ELSE IF M%<>4 THEN 800 ELSE IF P%<>1 THEN 800 ELSE 900
510 IF J=1 THEN 518 ELSE IF I=1 THEN 512 ELSE IF I=3 THEN 514 ELSE IF I=5 THEN 51
6
512 IF N%<>2 THEN 800 ELSE IF M%<>1 THEN 800 ELSE IFP%<>1 THEN 800 ELSE IF Q%<>2
THEN 800 ELSE 900
514 IF N%<>M% THEN 800 ELSE IF M%<>P% THEN 800 ELSE IF N%<>1 THEN 800 ELSE IF Q%<
>4 THEN 800 ELSE 900
516 IF N%<>2 THEN 800 ELSE IF M%<> 15 THEN 800 ELSE IF P%<>10 THEN 800 ELSE IF Q%
<>12 THEN 800 ELSE900
518 IF N%<>4 THEN 800 ELSE IF M%<>11 THEN 800 ELSE IF P%<>2 THEN 800 ELSE IF Q%<>
8 THEN 800 ELSE 900
520 IF J=1 THEN IF N%<>3 THEN 800 ELSE IF M%<>2 THEN 800 ELSE IF P%<>3 THEN 800 E
LSE IF Q%<>2 THEN 800 ELSE IF R%<>4 THEN 800 ELSE 900
522 IF N%<>2 THEN 800 ELSE IF M%<>2 THEN 800 ELSE IF P%<>2 THEN 800 ELSE IF Q%<>1
 THEN 800 ELSE IF R%<>4 THEN 800 ELSE 900
600 FOR J=1 TO 2\FOR I=1 TO 5
602 PRINT " UNBALANCED ----------> ";
604 PRINT TAB(27)'' A$(I,J)\PRINT TAB(27)'' B$(I,J) \PRINT
606 PRINT "********* BALANCED ------>";
607 PRINT TAB(35)'' C$(I,J)\PRINT TAB(35)'' B$(I,J)\PRINT
608 NEXT  I
610 NEXT J
611 GOTO 3000
800 PRINT\C1=C1+1
801 IF C1=1 THEN PRINT " YOU ARE INCORRECT. TRY AGAIN. " ELSE PRINT " YOU ARE WRO
NG AGAIN.  THE CORRECT ANSWER IS ------>";
802 IF C1 = 1 THEN 408 ELSE PRINT D$(I,J)\PRINT\PRINT " THE BALANCED EQUATION IS
AS FOLLOWS: ---------------> "\PRINT
803 PRINT TAB(25)''C$(I,J)\PRINT TAB(25)''B$(I,J)
804 C1=0\NEXT J
805 Z1=Z1+1
806 PRINT\ IF Z1>4 THEN PRINT " YOUR SESSION HAS ENDED. "\PRINT\GOTO 600
807 IF Z1=1 THEN V%=I ELSE IF Z1=2 THEN V1%=I ELSE IF Z1=3 THEN V2%=I ELSE IF Z1=
4 THEN V3%=I ELSE IF Z1=5 THEN V4%=I
808 GOTO400
900 PRINT A1$
901 GOTO 803
3000 END
```

```
EQUAT3  12:16            18-Apr-77
1 REM- THIS IS A PRACTICE SESSION IN BALANCING CHEMICAL EQUATIONS.
2 ! THIS PROGRAM HAS BEEN DEVELOPED BY DR. JULIO GALLARDO, AND MR. STEVEN DELGADO
, OF HOSTOS COMMUNITY COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SC
IENCE FOUNDATION.
3 PRINT\PRINT\PRINT
4 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME. ";A1$\PRINT
5 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER. ";A2$\PR
INT
6 PRINT " YOUR NAME IS, " A1$; ", AND YOUR SOCIAL SECURITY NUMBER "\PRINT
7 PRINT " IS, " A2$ ". ARE THEY CORRECT?  TYPE 'Y' FOR YES OR 'N' FOR NO. ";
8 INPUT A3$ \PRINT
9 IF A3$ = "N" THEN 3
10 IF A3$<> "Y" THEN PRINT " TYPE 'Y' OR 'N' ONLY!!!!!" \PRINT \GOTO6
59 DIM A$(10,10)\DIM B$(10,10)\DIM C$(10,10)
65 D$(1,3)="1,1,1,2"\D$(2,3)="1,1,1,2"\D$(3,3)="2,3,1,6"\D$(4,3)="2,2,2,1"\D$(5,3
)="3,1,1"
67 D$(1,4)="2,1,2"\D$(2,4)="1,3,2,3"\D$(3,4)="3,2,1,6"\D$(4,4)="1,2,1,1"\D$(5,4)=
"6,1,4"
99 A1$ = " CORRECT!!! "\B1$ = " WHAT ARE THE CORRECT COEFFICIENTS "
130 A$(1,3)=" BaCl   +   (NH ) CO   ----->   BaCO   +   NH Cl"
131 B$(1,3)="     2          4 2  3            3         4 "
132 A$(2,3)=" Al(OH)   +   NaOH  ----->   NaAlO   +   H O"
133 B$(2,3)="      3                          2       2"
134 A$(3,3)=" Fe(OH)   +   H SO   ----->   Fe (SO )   +   H O"
135 B$(3,3)="      3        2  4            2   4 3       2"
136 A$(4,3)=" Na   +   H O  ----->   NaOH  +  H "
137 B$(4,3)="          2                      2"
138 A$(5,3)=" Mg   +   N   ----->   Mg N "
139 B$(5,3)="          2            3 2 "
145 A$(1,4)=" Mg   +  O   ----->   MgO "
146 B$(1,4)="        2"
147 A$(2,4)=" C H O   +   O   ----->   CO   +   H O "
148 B$(2,4)="  2 6          2             2       2"
149 A$(3,4)=" FeCl   +   Na PO   ----->  Fe (PO )   +   NaCl "
150 B$(3,4)="     2         3  4           3   4 2 "
151 A$(4,4)=" CaC   +   H O  ----->  C H   +  Ca(OH) "
152 B$(4,4)="    2        2             2 2          2"
153 A$(5,4)=" Na O  +  P O    ----->   Na PO "
154 B$(5,4)="   2         4 10            3  4"
320 C$(1,3)=" BaCl   +   (NH ) CO   ----->   BaCO   +  2NH Cl "
321 C$(2,3)=" Al(OH)   +   NaOH  ----->   NaAlO   +  2H O "
322 C$(3,3)="2Fe(OH)   +  3H SO   ----->   Fe (SO )   +  6H O "
323 C$(4,3)="2Na   +  2H O  ----->  2NaOH  +  H "
324 C$(5,3)="3Mg   +   N   ----->   Mg N "
330 C$(1,4)="2Mg   +  O   ----->  2MgO "
331 C$(2,4)=" C H O   +  3O   ----->  2CO   +  3H O "
332 C$(3,4)="3FeCl   +  2Na PO   ----->  Fe (PO )   +  6NaCl "
333 C$(4,4)=" CaC   +  2H O  ----->  C H   +  Ca(OH) "
334 C$(5,4)="6Na O  +  P O    ----->  4Na PO "
380 RANDOMIZE
381 I=(INT(4*RND +1.5))\C1=0
384 IF Z1=1 THEN IF I=V% THEN 380
386 IF Z1=2 THEN IF I=V% THEN 380 ELSE IF I=V1% THEN 380
388 IF Z1=3 THEN IF I=V% THEN 380 ELSE IF I=V1% THEN 380 ELSE IF I=V2% THEN 380
390 IF Z1=4 THEN IF I=V% THEN 380 ELSE IF I=V1% THEN 380 ELSE IF I= V2% THEN 380
ELSE IF I=V3% THEN 380
400 FOR J=3 TO 4\Q1=Q1+1\PRINT\PRINT "   PROBLEM " Q1\IF Q1<10 THEN PRINT "   ***
***  *"ELSE PRINT "   ******* **"
405  PRINT\PRINT A$(I,J)\PRINT B$(I,J)\PRINT\PRINT B1$;
```

```
410 IF J=3 THEN IF I=5 THEN 700 ELSE 720
415 IF J=4 THEN IF I=1 THEN 700 ELSE IF I=5 THEN 700 ELSE 720
500 IF J=3 THEN 504 ELSE 507
504 IF N%<>3 THEN 800 ELSE IF M%<>1 THEN 800 ELSE IF P%<>1 THEN 800 ELSE 900
507 IF I=1 THEN IF N%<>2 THEN 800 ELSE IF M%<>1 THEN 800 ELSE IF P%<>2 THEN 800 E
LSE 900
508 IF N%<>6 THEN 800 ELSE IF M%<> 1 THEN 800 ELSE IF P%<>4 THEN 800 ELSE 900
509 IF J=3 THEN 520 ELSE 530
515 IF J=3 THEN 520 ELSE 530
520 IF I<3 THEN 525
521 IF I=3 THEN 522 ELSE 523
522 IF N%<>2 THEN 800 ELSE IF M%<>3 THEN 800 ELSE IF P%<>1 THEN 800 ELSE IF Q%<>6
 THEN 800 ELSE 900
523  IF N%<>2 THEN 800 ELSE IF M%<>2 THEN 800 ELSE IF P%<>2 THEN 800 ELSE IF Q%<>
1 THEN 800 ELSE 900
525 IF N%<>1 THEN 800 ELSE IF M%<>1 THEN 800 ELSE IF P%<>1 THEN 800 ELSE IF Q%<>2
 THEN 800 ELSE 900
530 IF I=2 THEN 532 ELSE IF I=3 THEN 534 ELSE 536
532 IF N%<>1 THEN 800 ELSE IF M%<>3 THEN 800 ELSE IF P%<>2 THEN 800 ELSE IF Q%<>3
 THEN 800 ELSE 900
534  IF N%<>3 THEN 800 ELSE IF M%<>2 THEN 800 ELSE IF P%<> 1 THEN 800 ELSE IF Q%<
>6 THEN 800 ELSE 900
536 IF N%<>1 THEN 800 ELSE IF M%<>2 THEN 800 ELSE IF P%<>1 THEN 800 ELSE IF Q%<>1
 THEN 800 ELSE 900
600 FOR J=3 TO 4\FOR I=1 TO 5
602 PRINT " UNBALANCED ----------> ";
604 PRINT TAB(27)'' A$(I,J)\PRINT TAB(27)'' B$(I,J)\PRINT
606 PRINT "********* BALANCED ------>";
607 PRINT TAB(30)'' C$(I,J)\PRINT TAB(30)'' B$(I,J)\PRINT
608 NEXT I
610 NEXT J
611 GOTO 3000
700 INPUT '';N%,M%,P%
710 GOTO 500
720 INPUT '';N%,M%,P%,Q%
725 GOTO 515
800 PRINT\C1=C1+1
802 IF C1=1 THEN PRINT "     YOU ARE INCORRECT. TRY AGAIN. " ELSE PRINT "     YOU
 ARE WRONG AGAIN.  THE CORRECT ANSWER IS ----------> ";
804 IF C1=1 THEN 410 ELSE PRINT D$(I,J)\PRINT\PRINT "          THE BALANCED EQUAT
ION IS AS FOLLOWS "
806 PRINT TAB(25)''C$(I,J)\PRINT TAB(25)''B$(I,J)
808 C1=0\NEXT J
810 Z1=Z1+1
812 PRINT \ IF Z1>4 THEN PRINT "     YOUR SESSION HAS ENDED. PLEASE CALL THE INSTR
UCTOR. "\PRINT\GOTO 600
814 IF Z1=1 THEN V%=I ELSE  IF Z1=2 THEN V1%=I ELSE IF Z1=3 THEN V2%=I ELSE IF Z1
=4 THEN V3%=I
816 GOTO 380
900 PRINT A1$
902 GOTO 806
3000 END
```

```
EQUAT4  09:19          19-Apr-77
1 REM- THIS IS A PRACTICE SESSION IN BALANCING CHEMICAL EQUATIONS.
2 ! THIS PROGRAM HAS BEEN DEVELOPED BY DR. JULIO GALLARDO, AND MR. STEVEN DELGADO
, OF HOSTOS COMMUNITY COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SC
IENCE FOUNDATION.
3 PRINT\PRINT\PRINT
4 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME. ";A1$\PRINT
5 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER. ";A2$\PR
INT
6 PRINT " YOUR NAME IS, " A1$; ", AND YOUR SOCIAL SECURITY NUMBER "\PRINT
7 PRINT " IS, " A2$ ". ARE THEY CORRECT?  TYPE 'Y' FOR YES OR 'N' FOR NO. ";
8 INPUT A3$ \PRINT
9 IF A3$ = "N" THEN 3
10 IF A3$<> "Y" THEN PRINT " TYPE 'Y' OR 'N' ONLY!!!!!" \PRINT \GOTO6
59 DIM A$(10,10)\DIM B$(10,10)\DIM C$(10,10)
60 D$(1,5)= "1,2,2,1"\D$(2,5)="1,2,1,4"\D$(3,5)="1,2,1,1"\D$(4,5)="1,1,1"\D$(5,5)
="1,1,1"
63 D$(1,6)="2,1,2"\D$(2,6)="1,1,2,1"\D$(3,6)="3,2,1,6"\D$(4,6)="2,1,1,1,1"\D$(5,6
)="17,2,16,18"
99 A1$ = " CORRECT!!! "\B1$ = " WHAT ARE THE CORRECT COEFFICIENTS "
160 A$(1,5)=" Sb O   +   NaOH  ----->   NaSbO   +  H O"
161 B$(1,5)="   2 3                              2      2"
162 A$(2,5)=" TiCl   +   H O   ----->  TiO   +   HCl"
163 B$(2,5)="     4       2                 2   "
164 A$(3,5)=" Pb  +   HCl  ----->  PbCl   +  H  "
165 B$(3,5)="                          2       2"
166 A$(4,5)=" NH   +  HCl  ----->  NH Cl"
167 B$(4,5)="   3                    4"
168 A$(5,5)=" MgO  +  SO   ----->  MgSO "
169 B$(5,5)="           3             4"
175 A$(1,6)=" Na  +  Cl   ----->   NaCl "
176 B$(1,6)="          2"
177 A$(2,6)="CaBr   +  H SO   ----->  HBr  +  CaSO "
178 B$(2,6)="    2      2  4                   4"
179 A$(3,6)=" Ca(OH)   +   H PO   ----->  Ca (PO )   +   H O "
180 B$(3,6)="       2        3  4            3   4 2       2"
181 A$(4,6)=" HCl  +  CaCO   ----->  CO   +  H O  +  CaCl "
182 B$(4,6)="              3             2       2          2"
183 A$(5,6)="  O   +   C H    ----->    CO  +    H O"
184 B$(5,6)="   2       8 18                      2"
340 C$(1,5)=" Sb O   +  2NaOH  ----->  2NaSbO   +  H O "
341 C$(2,5)=" TiCl   +  2H O  ----->  TiO   +  4HCl "
342 C$(3,5)=" Pb  +  2HCl  ----->  PbCl   +  H "
343 C$(4,5)=" NH   +  HCl  ----->  NH Cl "
344 C$(5,5)=" MgO  +  SO   ----->  MgSO "
350 C$(1,6)="2Na  +  Cl   ----->  2NaCl "
351 C$(2,6)="CaBr   +  H SO   ----->  2HBr  +  CaSO  "
352 C$(3,6)="3Ca(OH)   +  2H PO   ----->  Ca (PO )   +  6H O "
353 C$(4,6)="2HCl  +  CaCO   ----->  CO   +  H O  +  CaCl  "
354 C$(5,6)="17O   +  2C H    ----->  16CO  +  18H O "
380 RANDOMIZE\I=(INT(4*RND +1.5))\C1=0
384 IF Z1=1 THEN IF V%=I THEN 380
386 IF Z1=2 THEN IF I=V5 THEN 380 ELSE IF I=V1% THEN 380
388 IF Z1=3 THEN IF I=V% THEN 380 ELSE IF I=V1% THEN 380 ELSE IF I=V2% THEN 380
390 IF Z1=4 THEN IF I=V% THEN 380 ELSE IF I=V1% THEN 380 ELSE IF I= V2% THEN 380
ELSE IF I=V3% THEN 380
400 FOR J= 5 TO 6\Q1=Q1+1\PRINT\PRINT "          PROBLEM " Q1\IF Q1<10 THEN PRINT
"       *******  *" ELSE PRINT "       *******  **"
405 PRINT\PRINT A$(I,J)\PRINT B$(I,J)\PRINT\PRINT B1$;
410 IF J=5 THEN IF I<4 THEN 720 ELSE 700
415 IF J=6 THEN IF I=1 THEN 700 ELSE IF I=4 THEN 740 ELSE 720
500 IF J=5 THEN 504 ELSE 508
504 IF N%<>M% THEN 800 ELSE IF M%<>P% THEN 800 ELSE IF N%<>1 THEN 800 ELSE 900
508 IF N%<>2 THEN 800 ELSE IF M%<>1 THEN 800 ELSE IF P%<>2 THEN 800 ELSE 900
```

```
515 IF J=6 THEN 525 ELSE IF I=1 THEN 516 ELSE IF I=2 THEN 518 ELSE IF I=3 THEN 52
0
516 IF N%<>1 THEN 800 ELSE IF M%<>2 THEN 800 ELSE IF P%<>2 THEN 800 ELSE IF Q%<>1
 THEN 800 ELSE 900
518 IF N%<>1 THEN 800  ELSE IF M%<>2 THEN 300 ELSE  IF P%<>1 THEN 800 ELSE IF Q%<
>4 THEN 800 ELSE 900
520 IF N%<>1 THEN 800 ELSE IF M%<>2 THEN 800 ELSE IF P%<>1 THEN 800 ELSE IF Q%<>1
 THEN 800 ELSE 900
525 IF I=2 THEN 527 ELSE IF I=3 THEN 529 ELSE IF I=5 THEN 531
527 IF N%<>1 THEN 800 ELSE IF M%<>1 THEN 800 ELSE IF P%<> 2 THEN 800 ELSE IF Q%<>
1 THEN 800 ELSE 900
529 IF N%<>3 THEN 800 ELSE IF M%<>2 THEN 800 ELSE IF P%<>1 THEN 800 ELSE IF Q%<>6
 THEN 800 ELSE 900
531 IF N%<>17 THEN 800 ELSE IF M%<>2 THEN 800 ELSE IF P%<>16 THEN 800 ELSE IF Q%<
>18 THEN 800 ELSE 900
540 IF N%<>2 THEN 800 ELSE IF M%<>1 THEN 800 ELSE IF P%<>1 THEN 800 ELSE IF Q%<>1
 THEN 800 ELSE IF R%<>1 THEN 800 ELSE 900
600 FOR J= 5 TO 6\FOR I = 1TO 5
602 PRINT " UNBALANCED ----------> ";
604 PRINT TAB(25)''A$(I,J)\PRINT TAB(25)''B$(I,J)\PRINT
606 PRINT "********* BALANCED -------> ";
607 PRINT TAB(30)''C$(I,J)\PRINT TAB(30)''B$(I,J)\PRINT
608 NEXT I
610 NEXT J
611 GOTO 3000
700 INPUT '';N%,M%,P%
710 GOTO 500
720 INPUT '';N%,M%,P%,Q%
725 GOTO 515
740 INPUT '';N%,M%,P%,Q%,R%
745 GOTO 540
800 PRINT\C1=C1+1
802 IF C1=1 THEN PRINT "           YOU ARE INCORRECT. TRY AGAIN. " ELSE PRINT "
      YOU ARE WRONG AGAIN.  THE CORRECT ANSWER IS ----------> ";
804 IF C1=1 THEN 410 ELSE PRINT D$(I,J)\PRINT\PRINT "          THE BALANCED EQUAT
ION IS AS FOLLOWS: "
805 PRINT
806 PRINT TAB(25)''C$(I,J)\PRINT TAB(25)''B$(I,J)
808 C1=0\NEXT J
810 Z1=Z1+1\PRINT\IF Z1>4 THEN PRINT "          YOUR SESSION HAS ENDED. PLEASE CA
LL THE INSTRUCTOR. "\PRINT\GOTO 600
814 IF Z1=1 THEN V%=I ELSE IF Z1=2 THEN V1%=I ELSE IF Z1=3 THEN V2%=I ELSE IF Z1=
4 THEN V3%=I
815 GOTO 380
900 PRINT\PRINT A1$\GOTO 806
3000 END
```

```
EQUATS  09:31           19-Apr-77
1 REM- THIS IS A PRACTICE SESSION IN BALANCING CHEMICAL EQUATIONS.
2 ! THIS PROGRAM HAS BEEN DEVELOPED BY DR. JULIO GALLARDO, AND MR. STEVEN DELGADO
, OF HOSTOS COMMUNITY COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SC
IENCE FOUNDATION.
3 PRINT\PRINT\PRINT
4 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME. ";A1$\PRINT
5 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER. ";A2$\PR
INT
6 PRINT " YOUR NAME IS, " A1$; ", AND YOUR SOCIAL SECURITY NUMBER "\PRINT
7 PRINT " IS, " A2$ ". ARE THEY CORRECT?  TYPE 'Y' FOR YES OR 'N' FOR NO. ";
8 INPUT A3$ \PRINT
9 IF A3$ = "N" THEN 3
10 IF A3$<> "Y" THEN PRINT " TYPE 'Y' OR 'N' ONLY!!!!!" \PRINT \GOTO6
59 DIM A$(10,10)\DIM B$(10,10)\DIM C$(10,10)
60 D$(1,7)="4,3,2,6"\D$(2,7)="1,3,1,3"\D$(3,7)="1,1,1,1"\D$(4,7)="3,1,2,1"\D$(5,7
)="1,1,1,5"
63 D$(1,8)="6,6,1,6"\D$(2,8)="1,5,3,4"\D$(3,8)="2,3,2,2"\D$(4,8)="2,1,2"\D$(5,8)=
"2,3,1,6"
99 A1$ = " CORRECT!!! "\B1$ = " WHAT ARE THE CORRECT COEFFICIENTS "
190 A$(1,7)="  NH   +   O   ----->   N   +   H O "
191 B$(1,7)="    3       2            2       2"
192 A$(2,7)="  H PO   +   NaOH  ----->  Na PO   +   H O "
193 B$(2,7)="   3  4                     3  4      2
194 A$(3,7)="  NaCl  +   AgNO   ----->  NaNO   +  AgCl "
195 B$(3,7)="                  3            3 "
196 A$(4,7)="  NO   +  H O  ----->  HNO   +  NO "
197 B$(4,7)="    2'      2             3"
198 A$(5,7)="  PCl   +  H O  ----->  H PO   +   HCl "
199 B$(5,7)="     5      2            3  4"
205 A$(1,8)="  H O  +   CO   ----->  C H  O   +   O "
206 B$(1,8)="   2         2            6 12 6       2"
207 A$(2,8)="  C H   +   O   ----->   CO   +   H O "
208 B$(2,8)="   3 8       2             2       2 "
209 A$(3,8)="  ZnS   +   O   ----->   ZnO  +   SO "
210 B$(3,8)="             2                      2"
211 A$(4,8)="  Ca  +  O   ----->   CaO "
212 B$(4,8)="          2     "
213 A$(5,8)="  Al(OH)   +   K SO   ----->   Al (SO )   +   KOH "
214 B$(5,8)="        3       2  4              2   4 3 "
360 C$(1,7)="4NH   +  3O   ----->  2N   +  6H O "
361 C$(2,7)="  H PO   +  3NaOH  ----->  Na PO   +  3H O "
362 C$(3,7)="  NaCl  +  AgNO   ----->  NaNO   +  AgCl "
363 C$(4,7)="2NO   +  H O  ----->  2HNO   +  NO "
364 C$(5,7)="  PCl   +  H O  ----->  H PO   +  5HCl"
365 C$(1,8)="6H O  +  6CO   ----->  C H  O   +  6O  "
366 C$(2,8)="  C H   +  5O   ----->  3CO   +  4H O "
367 C$(3,8)="2ZnS  +  3O   ----->  2ZnO  +  2SO  "
368 C$(4,8)="2Ca  +  O   ----->  2CaO "
369 C$(5,8)="2Al(OH)   +  3K SO   ----->   Al (SO )   +  6KOH "
380 RANDOMIZE\I=(INT(4*RND +1.5))\C1=0
384 IF Z1=1 THEN IF V%=I THEN 380
386 IF Z1=2 THEN IF I=V% THEN 380 ELSE IF I=V1% THEN 380
388 IF Z1=3 THEN IFI=V% THEN 380 ELSE IF I=V1% THEN 380 ELSE IF I=V2% THEN 380
390 IF Z1=4 THEN IF I=V% THEN 380 ELSE IF I=V1% THEN 380 ELSE IF I=V2% THEN 380
ELSE IF I= V3% THEN 380
400 FOR J=7 TO 8\Q1%=Q1%+1%\PRINT\PRINT "          PROBLEM " Q1%\IF Q1%<10 THEN PRI
NT "        *******  * " ELSE PRINT "        *******  **"
405 PRINT\PRINT A$(I,J)\PRINT B$(I,J)\PRINT\PRINT B1$;
410 IF J=7 THEN 700 ELSE IF J=8 THEN IF I= 4 THEN 720 ELSE 700
500 IF N%<>2THEN 800 ELSE IF M%<>1 THEN 800 ELSE IF P%<>2 THEN 800 ELSE 900
510 IF J=7 THEN 512 ELSE 520
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```
512 IF I=1 THEN 514 ELSE IF I=2 THEN 515 ELSE IF I=3 THEN 516 ELSE IF I=4 THEN 51
7
513 IF N%<>1 THEN 800 ELSE IF M%<>1 THEN 800 ELSE IF P%<>1 THEN 800 ELSE IF Q%<>5
 THEN 800 ELSE 900
514 IF N%<>4 THEN 800 ELSE IF M%<>3 THEN 800 ELSE IF P%<>2 THEN 800 ELSE IF Q%<>6
 THEN 800 ELSE 900
515 IF N%<>1 THEN 800 ELSE IF M%<>3 THEN 800 ELSE IF P%<>1 THEN 800 ELSE IF Q%<>3
 THEN 800 ELSE 900
516 IF N%<>1 THEN 800 ELSE IF M%<>1 THEN 800 ELSE IF P%<>1 THEN 800 ELSE IF Q%<>1
 THEN 800 ELSE 900
517 IF N%<>3 THEN 800 ELSE IF M%<>1 THEN 800 ELSE IF P%<>2 THEN 800 ELSE IF Q%<>1
 THEN 800 ELSE 900
520 IF I=1 THEN 522 ELSE IF I=2 THEN 523 ELSE IF I=3 THEN 524 ELSE IF I=5 THEN 52
5
522 IF N%<>6 THEN 800 ELSE IF M%<>6 THEN 800 ELSE IF P%<>1 THEN 800 ELSE IF Q%<>6
 THEN 800 ELSE 900
523 IF N%<>1 THEN 800 ELSE IF M%<>5 THEN 800 ELSE IF P%<>3 THEN 800 ELSE IF Q%<>4
 THEN 800 ELSE 900
524 IF N%<>2 THEN 800 ELSE IF M%<>3 THEN 800 ELSE IF P%<>2 THEN 800 ELSE IF Q%<>2
 THEN 800 ELSE 900
525 IF N%<>2 THEN 800 ELSE IF M%<>3 THEN 800 ELSE IF P%<>1 THEN 800 ELSE IF Q%<>6
 THEN 800 ELSE 900
600 FOR J=7 TO 8
601 for i=1 to 5
602 PRINT " UNBALANCED ----------> ";
604 PRINT TAB(25)''A$(I,J)\PRINT TAB(25)''B$(I,J)\PRINT
606 PRINT "********** BALANCED ------>";
607 PRINT TAB(30)''C$(I,J)\PRINT TAB(30)''B$(I,J)\PRINT
608 NEXT I
610 NEXT J
611 GOTO 3000
700 INPUT '';N%,M%,P%,Q%
710 GOTO 510
720 INPUT '';N%,M%,P%
722 GOTO 500
800 PRINT\C1=C1+1
801 IF C1=1 THEN PRINT "          YOU ARE INCORRECT. TRY AGAIN. " ELSE PRINT "
      YOU ARE WRONG AGAIN.  THE CORRECT ANSWER IS  ----------> ";
802 IF C1=1 THEN 410 ELSE PRINT D$(I,J)\PRINT\PRINT "          THE BALANCED EQUAT
ION IS AS FOLLOWS: "
806 PRINT TAB(25)''C$(I,J)\PRINT TAB(25)''B$(I,J)
808 C1=0\NEXT J
810 Z1=Z1+1\PRINT\IF Z1>4 THEN PRINT "        YOUR SESSION HAS ENDED. PLEASE CAL
THE INSTRUCTOR. "\PRINT\GOTO 599
812 IF Z1=1 THEN V%=I ELSE IF Z1=2 THEN V1%=I ELSE IF Z1=3 THEN V2%=I ELSE IF Z1=
4 THEN V3%=I
816 GOTO380
900 PRINT\PRINT A1$\S=S+1
902 GOTO 806
3000 END
```

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CHE708  11:30            22-Apr-77
2 REM - THIS IS A PRACTICE SESSION ON STOICHIOMETRY.....................
3 ! THIS PROGRAM HAS BEEN DEVELOPED BY DR. JULIO GALLARDO AND MR. STEVEN DELGADO,
 OF HOSTOS COMMUNITY COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCI
ENCE FOUNDATION.
5 PRINT\PRINT\PRINT
6 INPUT "                              CODE # ";N1%\PRINT
7 PRINT\PRINT\PRINT\IF N1%=1 THEN 98
10 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME. ";A1$\PRINT
11 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER.";A2$\PR
INT
15 PRINT " YOUR NAME IS, " ;A1$;", AND YOUR SOCIAL SECURITY NUMBER "\PRINT
16 PRINT " IS, "A2$ ". ARE THEY CORRECT?  TYPE 'Y' FOR YES OR 'N' FOR NO. ";
17 INPUT A4$ \ PRINT
18 IF A4$ = "N" THEN10
19 IF A4$<>"Y" THEN PRINT " TYPE 'Y' OR 'N' ONLY!!!"\PRINT\GOTO 15
20 Q$ = A1$ +"" + A2$
21 R$ = SYS(CHR$(8%) + Q$)
98 PRINT\PRINT\PRINT
100 A3$ = " BASED ON THE FOLLOWING EQUATION: "\PRINT
131 B$(1,3)="     2          4 2  3                3          4 "
133 B$(2,3)="       3                                2          2"
135 B$(3,3)="       3        2  4                  2   4 3        2"
137 B$(4,3)="          2                            2"
139 B$(5,3)="          2                 3 2 "
320 C$(1,3)=" BaCl    +    (NH ) CO    ---->    BaCO    +  2NH Cl "
321 C$(2,3)=" Al(OH)    +    NaOH   ---->    NaAlO    +  2H O "
322 C$(3,3)="2Fe(OH)    +  3H SO    ---->    Fe (SO )    +  6H O "
323 C$(4,3)="2Na   +  2H O   ---->  2NaOH   +   H "
324 C$(5,3)="3Mg   +    N    ---->    Mg N "
325 T9$(1)= " grams"\T9$(2)= " moles"\T9$(3)=" moles"\T9$(4)=" liters"\T9$(5)= "
liters"
329 FOR Z%=1 TO 5\PRINT\PRINT
330 RANDOMIZE
331 Y1=(INT(40500*RND+30000))/100\Y2=(INT(24500*RND +25454))/100
332 X1=(INT(800*RND+85))/100\X2=(INT(786*RND+94))/100\X4=(INT(4256*RND+1542))/100
336 K1=0
337 K1=K1+1\FOR L5=30 TO 41\PRINT TAB(L5) "*";
338 NEXT L5
339 PRINT "***"\IF K1=2 THEN 345 ELSE PRINT TAB(30) "** PROBLEM"Z%;\PRINT "**"\GO
TO 337
345 PRINT\PRINT
346 PRINT TAB(5) '' A3$
347 PRINT\PRINT\PRINT TAB(15) '' C$(Z%,3)\PRINT TAB(15) ''B$(Z%,3)\PRINT
350 IF Z%<>1 THEN 360 ELSE PRINT " HOW MANY GRAMS OF BARIUM CHLORIDE ARE NEEDED T
O PRODUCE " X1 " moles OF "
351 PRINT " BARIUM CARBONATE? "
352 A(1%)= (INT(20700*X1))/100
360 IF Z%<>2 THEN 365 ELSE PRINT " HOW MANY MOLES OF SODIUM HYDROXIDE REACT WITH
ALUMINUM HYDROXIDE TO PRODUCE "
361 PRINT Y1 " grams OF WATER?
362 A(2%) = (INT(Y1/.36))/100
365 IF Z%<>3 THEN 370 ELSE PRINT X2 " moles OF SULFURIC ACID REACT WITH IRON HYDR
OXIDE.  HOW MANY MOLES OF "
366 PRINT " IRON SULFATE WILL BE PRODUCED? "
368 A(3%)= (INT(X2/.03))/100
370 IF Z%<>4 THEN 375 ELSE PRINT " IF " Y2 " grams OF SODIUM ARE MADE TO REACT WI
TH WATER, HOW MANY LITERS OF "
371 PRINT " HYDROGEN WILL BE COLLECTED IF THE REACTION TAKES PLACE AT " X1  "atm
AND"
372 PRINT X4 " DEGREES CENTIGRADE? "
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374 A(4%)= (INT((273+X4)*Y2*.178372/X1))/100
375 IF Z%<>5 THEN 379 ELSE PRINT " HOW MANY LITERS OF NITROGEN ARE REQUIRED TO RE
ACT WITH MAGNISIUM, IF " Y1
376 PRINT " grams OF Mg N , HAVE TO BE PRODUCED AT STP?
377 PRINT "              3 2 "
378 A(5%) = (INT(Y1*22.4))/100
379 IF N1%=1 THEN 385
380 PRINT\PRINT
381 INPUT "              YOUR ANSWER IS ---------------->";B(Z%)\PRINT\PRINT
382 IF ABS(A(Z%)-B(Z%))>.03 THEN 500 ELSE 515
385 IF Z%=5 THEN 799
386 NEXT Z%
500 C1=C1+1\IF C1=1 THEN PRINT "          YOU ARE INCORRECT. TRY AGAIN." ELSE PR
INT "     YOU ARE WRONG AGAIN. THE CORRECT ANSWER IS ---------------> ";
501 IF C1=1 THEN 380 ELSE PRINT A(Z%);T9$(Z%)
502 C1=0
503 GOTO  385
515 S=S+1\Z$ = "                    CORRECT!!!!!! "
516 PRINT\PRINT\PRINT Z$
517 GOTO 502
799 IF N1%=1 THEN 810
800 PRINT\PRINT\PRINT   "       THIS SESSION HAS ENDED.  IF YOU WISH TO CONTINUE
TO MORE DIFFICULT "
801 PRINT "    PROBLEMS, TYPE THE LETTER 'D', AND THEN PRESS THE 'RETURN KEY.";
802 INPUT "";H$
803 IF H$="D" THEN CHAIN "CHE718"25
805 PRINT\PRINT\PRINT
806 PRINT "" A1$ ", HAS ENDED THIS SESSION AT  " TIME$(0) "."
807 PRINT\PRINT"" A1$ ", HAS ANSWERED" S " QUESTION CORRECTLY."\PRINT
808 PRINT "     THE FOLLOWING IS A LISTING OF " A1$ "'S ANSWERS AND THE "
809 PRINT " CORRECT ANSWER FOR EACH PROBLEM: "
810 PRINT\PRINT\PRINT\PRINT
815 PRINT TAB(5) "PROBLEM";TAB(25) "CORRECT ANSWER";
816 PRINT TAB(50) ""A1$;\PRINT "'S ANSWER"
817 PRINT\PRINT
819 FOR I%=1% TO 5%
820 PRINT TAB(8) '' I%;TAB(30) '' A(I%);TAB(62) '' B(I%)
822 NEXT I%
3000 END

Ready
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CHE718  11:34            22-Apr-77
2 REM - THIS IS A PRACTICE SESSION ON STOICHIOMETRY.....................
3 ! THIS PROGRAM HAS BEEN DEVELOPED BY DR. JULIO GALLARDO AND MR. STEVEN DELGADO,
 OF HOSTOS COMMUNITY COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCI
ENCE FOUNDATION.
5 PRINT\PRINT\PRINT
6 INPUT "                              CODE # ";N1%\PRINT
7 IF N1% = 1 THEN 98
10 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME. ";A1$\PRINT
11 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER.";A2$\PR
INT
15 PRINT " YOUR NAME IS, " ;A1$;", AND YOUR SOCIAL SECURITY NUMBER "\PRINT
16 PRINT " IS, "A2$ " ARE THEY CORRECT?  TYPE 'Y' FOR YES OR 'N' FOR NO. ";
17 INPUT A4$ \ PRINT
18 IF A4$ = "N" THEN10
19 IF A4$<>"Y" THEN PRINT " TYPE 'Y' OR 'N' ONLY!!!"\PRINT\GOTO 15
20 GOTO 98
25 PRINT\PRINT\PRINT
26 R$ =SYS(CHR$(7%))
29 W=LEN(R$)\A1$=MID(R$,1,W-9)
30 H1=LEN (A1$)
31 A2$=MID(R$,H1+1,9)
32 GOTO 15
98 DIM A(10), B(10)
99 DIM B$(10,10)\DIM C$(10,10)
100 A3$ = " BASED ON THE FOLLOWING EQUATION: "\PRINT
101 B$(1,1)="  2       2          2  "
103 B$(2,1)="  2       2           3 "
105 B$(3,1)="    2       2           2 3       2"
107 B$(4,1)="     3                  2"
109 B$(5,1)="  2         3                      2"
116 B$(1,2)="            2  4           2  4 "
118 B$(2,2)="                           4"
120 B$(3,2)="    4 2  2 7           2       2 3       2"
122 B$(4,2)="    2       2                  2        "
124 B$(5,2)="  5 11          2              2       2"
300 C$(1,1)="2H   +   O   ----->  2H O "
301 C$(2,1)=" N   +  3H   ----->  2NH "
302 C$(3,1)="4FeS   +  11O   ----->  2Fe O   +  8SO "
303 C$(4,1)="2KClO   ----->  2KCl  +  3O "
304 C$(5,1)="3H S  +  2HNO   ----->  3S  +  2NO  +  4H O "
310 C$(1,2)="2NaCl  +   H SO   ----->   Na SO   +  2HCl "
311 C$(2,2)=" Ni  +  4CO  ----->   Ni(CO) "
312 C$(3,2)=" (NH ) Cr O   ----->   N   +   Cr O   +  4H O "
313 C$(4,2)="2KrF   +  2H O  ----->  2Kr  +   O   +  4HF "
314 C$(5,2)="2C H  OH  +  15O   ----->  10CO   +  12H O "
350 FOR Z% = 1 TO 10
355 RANDOMIZE
356 PRINT\PRINT
361 PRINT "          PROBLEM " Z%
362 IF Z%<10% THEN PRINT "          *******  * " ELSE PRINT "          *******  *
*"
363 PRINT\PRINT
370 V1=(INT(700*RND+100))/100\V2=(INT(710*RND+90))/100
371 ! V1 AND V2 ARE VOLUMES WITH VALUES BETWEEN 1 AND 8 WITH 2 DECIMALS>
375 M1=(INT(4985*RND+15))/1000\M2=(INT(4987*RND+13))/1000
376 ! M1 AND M2 ARE MOLES BETWEEN THE VALUES .015 AND 5.000 WITH 3 DECIMAL PLACES
>
380 M3=(INT(4000*RND+1000))/100\M4=(INT(4005*RND+995))/100
381 ! M3 AND M4 ARE MASS UNITS IN GRAMS BETWEEN 10 AND 50 WITH 2 DECIMALS>
385 M5=(INT(900*RND+1.5))/100\M6=(INT(905*RND+1))
386 ! M5 AND M6 ARE MASS UNITS BETWEEN THE VALUE OF .015 AND 10 WITH 2 DECIMAL PL
ACES>
390 M7=(INT(29500*RND+10500))/100\M8=(INT(30000*RND+10000))/100
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391 ! M7 AND M8 ARE MASS UNITS BETWEEN THE VALUE S OF 100 AND 400 WITH 2 DECIMAL
PLACES.
395 M9=(INT(700*RND+100))/100\M0=(INT(750*RND+50 ))/100
396 ! M9 AND M0 ARE MASS UNITS BETWEEN THE VALUE OF 1 AND 8 TO BE USED WITH KILOG
RAMS AND HAS 2 DECIMAL PLACES.
400 IF Z%<>1 THEN 410 ELSE PRINT  A3$\PRINT
401 PRINT TAB(15)''C$(1,1)\PRINT TAB(15)''B$(1,1)\PRINT
402 PRINT " CALCULATE THE NUMBER OF LITERS OF O  (AT STP) NEEDED TO FORM" M1 "MOL
ES"
403 PRINT TAB(36)"2"\PRINT
404 A(1) = (INT(M1*1120))/100
410 IF Z%<>2 THEN 420 ELSE PRINT A3$\PRINT
411 PRINT TAB(15)''C$(4,1)\PRINT TAB(15)''B$(4,1)\PRINT
412 PRINT " CALCULATE THE NUMBER OF MOLES OF O  PRODUCED BY HEATING" M3 "g OF"
413 PRINT TAB(35)"2"
414 PRINT " POTASSIUM CHLORATE (KC1O )."
415 PRINT TAB(25)"3"\PRINT
416 A(2)=(INT(300*M3/228.9))/100
420 IF Z%<>3 THEN 430 ELSE PRINT A3$\PRINT
421 PRINT TAB(15)''C$(1,2)\PRINT TAB(15)''B$(1,2)\PRINT
422 PRINT " IF" M3 "g OF NaCl ARE REACTED WITH" M4 "g OF SULFURIC ACID"\PRINT
423 PRINT " (H SO ).  HOW MANY MOLES OF Na SO  ARE PRODUCED?"
424 PRINT TAB(3)"2";TAB(6)"4";TAB(31)"2";TAB(34)"4"\PRINT
425 A(3) = (INT(M3*100/116.9))/100
430 IF Z%<>4 THEN 440 ELSE PRINT A3$\PRINT
431 PRINT TAB(15)''C$(5,1)\PRINT TAB(15)''B$(5,1)\PRINT
432 PRINT " IF" M2 "MOLES OF HYDROGEN SULFIDE GAS REACTS WITH AN EXCESS OF NITRIC
 ACID, HOW"\PRINT
433 PRINT " MANY GRAMS OF NITROUS OXIDE ARE PRODUCED? "\PRINT
435 A(4) = (INT(6000*M2/3))/100
440 IF Z%<>5 THEN 450 ELSE PRINT A3$\PRINT
441 PRINT TAB(15)''C$(2,1)\PRINT TAB(15)''B$(2,1)\PRINT
442 PRINT " HOW MANY LITERS OF NITROGEN GAS WOULD DISAPPEAR IN THE PRODUCTION OF"
 V1 "1 OF"\PRINT
443 PRINT " GASEOUS AMMONIA, BOTH GASES BEING MEASURED AT THE SAME TEMPERATURE AN
D PRESSURE? "\PRINT
445 A(5) = (INT(V1*50))/100
450 IF Z%<>6 THEN 460 ELSE PRINT A3$\PRINT
451 PRINT TAB(15)''C$(3,1)\PRINT TAB(15)''B$(3,1)\PRINT
452 PRINT " HOW MANY KILOGRAMS OF FERRIC OXIDE (Fe O ) CAN BE OBTAINED BY ROASTIN
G" M9
453 PRINT TAB(39)"2";TAB(41)"3"
454 PRINT " kg OF FERROUS SULFIDE (FeS )? "
455 PRINT TAB(27)"2"\PRINT
456 A(6) = (INT(M9*4800/32))/100
460 IF Z%<>7 THEN 470 ELSE PRINT A3$\PRINT
461 PRINT TAB(15)''C$(2,2)\PRINT TAB(15)''B$(2,2)\PRINT
462 PRINT " A" M4 "g SAMPLE OF NICKEL IS ALLOWED TO REACT WITH CARBON MONOXIDE (C
O)."\PRINT
463 PRINT " CALCULATE THE NUMBER OF MOLES OF CO NEEDED TO PRODUCE THE REACTION."!
PRINT
465 A(7) = (INT(M4*6.78))/100
470 IF Z%<>8 THEN 480 ELSE PRINT A3$\PRINT
471 PRINT TAB(15)''C$(3,2)\PRINT TAB(15)''B$(3,2)\PRINT
472 PRINT " CALCULATE THE NUMBER OF GRAMS OF AMMONIUM DICHROMATE NECESSARY TO PRO
DUCE"\PRINT
473 PRINT V2 "LITERS OF NITROGEN AT STP."\PRINT
475 A(8) = (INT(27600*V2/22.4))/100
480 IF Z%<>9 THEN 490 ELSE PRINT A3$\PRINT
481 PRINT TAB(15)''C$(4,2)\PRINT TAB(15)''B$(4,2)\PRINT
482 PRINT " HOW MANY MOLES OF HYDROGEN FLUORIDE COULD BE PRODUCED BY THE REACTION
 OF"\PRINT
483 PRINT M2 "MOLES OF KRYPTON (Kr) DIFLUORIDE AND WATER?"\PRINT
485 A(9) = (INT(M2*200))/100
```

```
490 IF Z%<>10 THEN 600 ELSE PRINT A3$\PRINT
491 PRINT TAB(15)''C$(5,2)\PRINT TAB(15)''B$(5,2)\PRINT
492 PRINT " CALCULATE THE NUMBER OF GRAMS OF OXYGEN REQUIRED TO BURN" M8 "g"\PRIN
T
493 PRINT " OF C H  OH TO CARBON DIOXIDE (CO ) AND WATER. "
494 PRINT TAB(5)"5";TAB(7)"11";TAB(33)"2"\PRINT\PRINT
495 A(10) = (INT(272.73*M8))/100
600 IF N1%=1 THEN 699 ELSE 750
699 C1=0\IF Z%=10 THEN 800
700 NEXT Z%
750 PRINT\PRINT\INPUT "     YOUR ANSWER ---------> ";B(Z%)
752 PRINT\IF (ABS(A(Z%)-B(Z%)))>.01 THEN 780 ELSE PRINT "     CORRECT !!!!! "
753 S=S+1\PRINT\GOTO 699
780 C1=C1+1\IF C1=1 THEN PRINT "     YOU ARE INCORRECT, TRY AGAIN. " ELSE PRINT
"     YOU ARE WRONG AGAIN. THE CORRECT ANSWER IS ---------> "A(Z%);
781 IF C1=1 THEN 750
782 IF Z%=5 THEN PRINT "liters" ELSE IF Z%=8 THEN PRINT "grams" ELSE IF Z%=2 THEN
 PRINT "moles" ELSE IF Z%=3 THEN PRINT "moles" ELSE IF Z%=7 THEN PRINT "moles" EL
SE IF Z%= 9 THEN PRINT "moles"
784 IF Z%=1 THEN PRINT "liters" ELSE IF Z%=6 THEN PRINT "Kg" ELSE IF Z%=4 THEN PR
INT"grams" ELSE IF Z%=10 THEN PRINT "grams"\GOTO699
785 GOTO 699
800 PRINT\PRINT\PRINT "    " A1$ " HAS ENDED THIS SESSION AT "TIME$(0)"."\PRINT
801 PRINT "    "A1$ " HAS ANSWERED " S " QUESTIONS CORRECTLY."\PRINT
802 PRINT  "HERE ARE THE CORRECT ANSWERS AND " A1$ "'S ANSWERS."
803 PRINT\PRINT
806 PRINT TAB(8)"PROBLEM";TAB(28)"CORRECT ANSWER";TAB(58)"STUDENT'S ANSWER"
807 PRINT TAB(8)"*******";TAB(28)"**************";TAB(58)"****************"\PRINT
\PRINT
810 FOR J% = 1 TO 10
811  IF J%<10 THEN PRINT TAB(10)''J%;ELSE PRINT TAB(9)''J%;
812 PRINT TAB(32)''A(J%);TAB(63)''B(J%)
815 NEXT J%
3000 END

Ready
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CHE808  13:36            19-Apr-77
1 REM -  THIS IS A PRACTICE SESSION IN GAS LAWS. >>>>>>>>>>>>>>>>
2 ! THIS PROGRAM HAS BEEN DEVELOPED BY DR. JULIO GALLARDO, OF HOSTOS COMMUNITY
    COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCIENCE FOUNDATION.
5 INPUT "          CODE # "; N%\PRINT\PRINT\PRINT
6 ! N%=1 WILL GIVE A PRINT OUT OF THE PROBLEMS WITH ANSWERS
7 IF N%=1 THEN 49
8 ! N1$ WILL BE THE STUDENT'S NAME WHILE S1$ WILL BE HIS SOCIAL SECURITY NUMBER
11 DIM A(15),B(15)
12 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME.  ";N1$
13 PRINT
14 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER.  " ; S1
$
15 PRINT
20 PRINT " YOUR NAME IS, "N1$ " AND YOUR SOCIAL SECURITY NUMBER "\PRINT
21 PRINT " IS, " S1$ ". ARE THEY CORRECT?  TYPE 'YES' OR 'NO'. ";
22 INPUT S2$\PRINT
25 IF S2$='NO' THEN 12 ELSE IF S2$<>'YES' THEN PRINT " TYPE 'YES' OR 'NO' ONLY."\
PRINT
26 IF S2$<>'YES' THEN 12
49 Z1=1
50 RANDOMIZE
52 FOR Z= Z1 TO 15
55 T1=(INT(1000*RND +500))/10\T2=(INT(1000*RND +400))/10
56 ! T1 AND T2 ARE TEMPERATURES WITH VALUES BETWEEN 50 AND 150 DEGREES
58 P1=(INT(7000*RND +5000))/10\P2=(INT(8000*RND+4000))/10\P3=(INT(7000*RND=8000))
/10
59 ! P1,P2,P3 ARE VALUES OF PRESSURE BETWEEN 400 AND 1500
60 P4=(INT(40*RND+15))/10\P5=(INT(43*RND+16))/10
61 ! P4 AND P5 ARE VALUES OF PRESSURE IN ATM
62 V1=(INT(10000*RND+2000))/10\V2=(INT(10000*RND+2000))/10\V3=(INT(2*RND+115))/10
63! V1 AND V2 ARE VALUES OF VOLUME IN MILLILITERS AND V3 IN LITERS
65 A1$=" CENTIGRADE"\A2$=" FAHRENHEIT"\A3$=" KELVIN"\A4$=" TORR"\A5$=" ATM"\A6$=
" MILLILITERS"\A7$=" LITERS"
66 A8$="DEGREES"
68 PRINT\PRINT "          PROBLEM " Z\IF Z<10 THEN PRINT "          ******* *" E
LSE PRINT "          ******* **"
80 DEF FNC(T1)=(5*(T1-32))/9
81 DEF FNB(T1)=9*T1/5 +32
85 A9$= "          CORRECT !!!!! "
87 B2$= "     YOU ARE INCORRECT.  TRY AGAIN. "
88 B3$="  YOU ARE WRONG AGAIN. THE CORRECT ANSWER IS ---------->  "
99 PRINT\PRINT
100 IF Z<>1 THEN 110 ELSE PRINT " THE TEMPERATURE OF AN OBJECT IS "T1  " DEGREES
"A1$". "
101 PRINT " EXPRESS THIS TEMPERATURE IN " A8$''A2$"."
103 A(1)=(INT(FNB(T1)*100))/100
110 IF Z<>2 THEN 115 ELSE PRINT " A GAS EXERTS A PRESSURE OF" P1''A4$". GIVE THIS
 PRESSURE IN"
111 PRINT A5$"."
113 A(2)= (INT(100*P1/760))/100
115 IF Z<>3 THEN 120 ELSE PRINT " WHEN THE TEMPERATURE OF A GAS IS" T1' 'A8$''A1$
", THEN"
116 PRINT " THE PRESSURE IS" P1 '' A4$". IF THE TEMPERATURE CHANGES TO" T2
117 PRINT ' 'A8$''A1$ ", WHAT WOULD THE NEW PRESSURE BE? "
118 A(3)=(INT((100*P1*(T2+273))/(T1+273)))/100
120 IF Z<>4 THEN 125 ELSE PRINT " A GAS OCCUPIES A VOLUME OF"V1''A6$ " WHEN THE T
EMPERATURE IS"
121 PRINT ''T1''A8$''A1$". FIND THE VOLUME WHEN THE TEMPERATURE OF THE"
122 PRINT " SAME GAS CHANGES TO"T2''A8$''A1$'.'
124 A(4)=(INT(100*V1*(T2+273)/(T1+273)))/100
125 IF Z<>5 THEN 130 ELSE PRINT V1''A6$" OF A GAS, EXERTS A PRESSURE OF"P1''A4$".
"
126 PRINT " WHAT WOULD BE THE VOLUME OF THE SAME GAS IF THE PRESSURE IS CHANGED TO"
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```
126 PRINT " WHAT WOULD BE THE VOLUME OF THE SAME GAS IF THE PRESSURE IS CHANGED T
O"
127 PRINT P2''A4$ "? "
128 A(5)=(INT(100*P1*V1/P2))/100
130 IF Z<>6 THEN 140 ELSE PRINT " THE PRESSURE OF A GAS IS"P5''A5$" WHEN THE TEMP
ERATURE IS"T1
131 PRINT ' 'A8$''A2$". WHAT WOULD THE PRESSURE BE IF THE TEMPERATURE "
132 PRINT " CHANGES TO"T2' 'A8$''A2$ "? "
135 A(6)=(INT(100*P5*(FNC(T2)+273)/(FNC(T1)+273)))/100
140 IF Z<>7 THEN150 ELSE PRINT " WHAT WOULD THE TEMPERATURE OF"V1''A6$" OF A GAS
BE,"
141 PRINT " IF"V2''A6$" OF THE SAME GAS HAVE A TEMPERATURE OF"T1
142 PRINT ' 'A8$''A2$ "?"
145 A(7)= (INT(100*(FNC(T1)+273)*V1/V2))/100
150 IF Z<>8 THEN 155 ELSE PRINT " WHAT WOULD THE VOLUME OF A GAS BE WHEN THE TEMP
ERATURE IS" T1
151 PRINT " "A8$''A1$", IF THE VOLUME AT STP IS"V1''A6$" AND THE"
152 PRINT " PRESSURE REMAINS UNCHANGED? "
153 A(8)=(INT(100*V1*(T1+273)/273))/100
155 IF Z<>9 THEN 160 ELSE PRINT " A GAS MEASURES"V1''A6$" AT"P4''A5$". CALCULATE
ITS VOLUME"
156 PRINT " AT"P5''A5$". "
157 A(9)=(INT(100*P4*V1/P5))/100
160 IF Z<>10 THEN 165 ELSE PRINT " A SAMPLE OF GAS HAS A VOLUME OF"V1''A6$" WHEN
MEASURED"
161 PRINT " AT"T1' 'A8$''A1$" AND"P1''A4$". WHAT VOLUME WILL IT"
162 PRINT " OCCUPY AT THE SAME TEMPERATURE AND"P2''A4$"?"
164 A(10)=(INT(100*V1*P1/P2))/100
165 IF Z<>11 THEN 170 ELSE PRINT " A SAMPLE OF GAS OCCUPIES"V1''A6$" AT"T1''A8$''
A1$
166 PRINT " AND"P1''A4$". WHAT VOLUME WILL IT HAVE AT"T2' 'A8$''A1$
167 A(11) = (INT(100*V1*(T2+273)/(T1+273)))/100
170 IF Z<>12 THEN 175 ELSE PRINT " A SAMPLE OF GAS OCCUPIES"V3''A7$" AT"T1' 'A8$'
'A2$"."
171 PRINT " CALCULATE ITS VOLUME WHEN THE TEMPERATURE IS"T2' 'A8$''A2$"."
173 A(12)= (INT((V1*(FNC(T2)+273)*100)/(FNC(T1)+273)))/100
175 IF Z<>13 THEN 185 ELSE PRINT " A SAMPLE OF GAS OCCUPIES" V3''A7$ " AT"P1''A4$
" AND"T1
176  PRINT " "A8$''A1$". AT WHAT TEMPERATURE IN "A8$''A1$" WOULD THE"
177 PRINT " PRESSURE BE" P2''A4$ ", IF THE VOLUME REMAINS CONSTANT? "
179 A(13)=((INT(100*P2*(FNC(T1)+273)/P1)))/100 -273
185 IF Z<>14 THEN 195 ELSE PRINT " A CERTAIN GAS OCCUPIES A VOLUME OF"V1''A6$ " A
T"T1' 'A8$
186 PRINT ''A1$ " AND"P1''A4$". WHAT VOLUME WILL IT OCCUPY AT STP? "
188 A(14)=(INT(100*(P1*V1*(T2+273))/((T1+273)*P2)))/100
195 IF Z<>15 THEN 500 ELSE PRINT " A GAS MEASURES "V1''A6$" AT STP. CALCULATE ITS
 PRESSURE IN " A5$
196 PRINT " IF ITS VOLUME IS CHANGED TO "V3''A7$ " AND THE TEMPERATURE TO " T1
197 PRINT ' 'A8$''A1$"."
198 A(15)= (INT((V1*100*(T1+273))/(273*V2)))/100
499 PRINT\PRINT
500 IF N%=1 THEN 1999
501PRINT
502 INPUT "          YOUR ANSWER ---------->";B(Z)
503 PRINT
505 IF (ABS(A(Z)-B(Z)))>.01 THEN 600 ELSE PRINT A9$\S1=S1+1
506 GOTO 1999
507 ! S1 COUNTS CORRECT ANSWERS
600 C1=C1+1\IF C1=1 THEN PRINT B2$ ELSE PRINT B3$;
605 IF C1=1 THEN 501 ELSE PRINT A(Z);
606  IF Z=1 THEN PRINT ''A8$ ELSE IF Z=2 THEN PRINT''A5$ ELSE IF Z=3 THEN PRINT''
A4$ ELSE IF Z=4 THEN PRINT''A6$ ELSE IF Z=5 THEN PRINT''A6$ ELSE IF Z=6 THEN PRIN
T''A5$ ELSE GOTO 607
```

```
607 IF Z=7 THEN PRINT''A8$''A3$ ELSE IF Z=8 THEN PRINT''A6$ ELSE IF Z=9 THEN PRIN
T''A6$ ELSE IF Z=10 THEN PRINT''A6$ ELSE IF Z=11 THEN PRINT A6$ ELSE GOTO 608
608 IF Z=12 THEN PRINT''A7$ ELSE IF Z=13 THEN PRINT' 'A8$''A1$ ELSE IF Z=14 THEN
PRINT''A6$ ELSE IF Z=15 THEN PRINT''A5$\GOTO 1999
1999 Z1=Z1+1\PRINT\IF Z1=6 THEN 2019 ELSE IF Z1=11 THEN 2019
2014 IF Z>14 THEN 2400
2015 C1=0\NEXT Z
2019 PRINT
2020 PRINT " IF YOU WISH TO CONTINUE TYPE 'YES', OTHERWISE TYPE 'NO'.";
2021  INPUT S5$
2022 PRINT\PRINT\PRINT
2025 IF S5$="NO" THEN 2400 ELSE 2015
2400 PRINT " THE STUDENT " N1$ " HAS ENDED THIS SESSION. "N1$
2401 PRINT\PRINT " HAS ANSWERED " S1 " QUESTIONS CORPECTLY. "\PRINT
2405 PRINT " HERE ARE THE CORRECT ANSWERS AND "N1$ "'S ANSWERS: "
2499 PRINT\PRINT\PRINT
2500 PRINT TAB(5) "PROBLEM";TAB(18) " CORRECT ANSWER";TAB(40) "STUDENT'S ANSWER"
2502 PRINT TAB(5) "*******"; TAB(18) " **************"; TAB(40) "****************
"
2505 PRINT\PRINT
2510 FOR Z=1 TO Z1-1
2512 PRINT TAB(8)''Z;TAB(25)''A(Z);TAB(46)''B(Z)
2520 NEXT Z
3000 END
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CHE908  14:02            19-Apr-77
1 REM -  THIS IS A PRACTICE SESSION IN SOLUTIONS. >>>>>>>>>>>>>>>
2 ! THIS PROGRAM HAS BEEN DEVELOPED BY DR. JULIO GALLARDO, OF HOSTOS COMMUNITY
    COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCIENCE FOUNDATION.
5 INPUT "          CODE # " ;N%
6 PRINT\PRINT\PRINT
7 IF N%=1 THEN 40
10 DIM A(15),B(15)
12 INPUT" AFTER THE QUESTION MARK (?), TYPE YOUR NAME.  " ; A5$
13 PRINT
14 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER. " ;S1$
15 PRINT
17 PRINT " YOUR NAME IS, " A5$ " AND YOUR SOCIAL SECURITY NUMBER IS,"
18 PRINT\PRINT' 'S1$ ". ARE THEY CORRECT? "\PRINT
20 INPUT " TYPE 'YES' OR 'NO'. "; S2$
22 PRINT\PRINT \IF S2$="NO" THEN 12 ELSE IF S2$<>"YES" THEN 20
40 RANDOMIZE
50 FOR Z=1 TO 15
53  PRINT\PRINT
54 IF Z<10 THEN PRINT "          *******  * " ELSE PRINT "          *******  ** "
55 PRINT "          PROBLEM " Z
56 IF Z<10 THEN PRINT "          *******  * " ELSE PRINT "          *******  ** "
57 PRINT
60 X1=(INT(6000*RND+3050))/10\X2=(INT(5555*RND+5555))/10
61 ! X1 AND X2 ARE NUMBERS BETWEEN 300 AND 1100 WITH 1 DECIMAL
65 Y1=(INT(375*RND+155))/10\Y2=(INT(425*RND+125))/10
66 ! Y1 AND Y2 ARE PERCENTS
70 X5=(INT(6000*RND+905))/100\X6=(INT(5555*RND+875))/100
73 X3=(INT(20000*RND+10500))/100\X4=(INT(19000*RND+11000))/100
99 PRINT
100 IF Z<>1 THEN 110 ELSE PRINT " HOW MANY GRAMS OF SUGAR MUST BE ADDED TO " X1 "
 GRAMS OF WATER TO "
101 PRINT " PREPARE A " Y1 " PERCENT SOLUTION?"
103 A(1)= (INT(100*X1*Y1/(100-Y1)))/100
110 IF Z<>2 THEN 120 ELSE PRINT " IF " X5 " GRAMS OF SODIUM CHLORIDE (NaCl) IS DI
SSOLVED IN ENOUGH "
111 PRINT " WATER TO MAKE " X2 " GRAMS OF SOLUTION, CALCULATE THE PERCENT "
112 PRINT " CONCENTRATION OF NaCl "
115 A(2)= (INT(X5*100*100/X2))/100
120 IF Z<>3 THEN 130 ELSE PRINT " CALCULATE THE NUMBER OF GRAMS OF SOLUTION NECES
SARY TO PROVIDE "X2
121 PRINT " GRAMS OF SODIUM BICARBONATE FROM A " Y1 " PERCENT SODIUM "
122 PRINT " BICARBONATE SOLUTION. "
125 A(3)= (INT(10000*X2/Y1))/100
130 IF Z<>4 THEN 140 ELSE PRINT " CALCULATE THE MOLALITY OF A SOLUTION THAT CONTA
INS " X3 " GRAMS"
131 PRINT " ETHYL ALCOHOL (C H O) IN " X1" GRAMS OF WATER. "
132 PRINT "                    2 6   "
135 A(4)= (INT(100000*X3/(X1*46)))/100
140 IF Z<> 5 THEN 150 ELSE PRINT " CALCULATE THE NUMBER OF GRAMS OF SOLUTE NECESS
ARY TO PREPARE " X2
141  PRINT " GRAMS OF A " Y1/100 "m (MOLAL) SOLUTION OF SULFURIC ACID. "
142 PRINT  " THE MOLECULAR FORMULA  OF SULFURIC ACID IS H SO  "
143 PRINT  "                                                  2  4  "
145 A(5)= (INT(98*Y1*X2*100/(100000+Y1*98)))/100
150 IF Z<>6 THEN 160 ELSE PRINT " CALCULATE THE NUMBER OF GRAMS OF WATER THAT MUS
T BE ADDED TO " 2*X5 "g"
152 PRINT " OF GLUCOSE (C H  O ) IN THE PREPARATION OF A " Y1/100 "m SOLUTION. "
153 PRINT "                6 12 6   "
155 A(6)= (INT(2*X5*10000000/(180*Y1)))/100
160 IF Z<>7 THEN 170 ELSE PRINT " HOW MANY GRAMS OF A " Y1 " PERCENT SILVER NITRA
TE ( AgNO  ) SOLUTION "
161 PRINT "                                                  3 "
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163 PRINT " ARE NECESSARY TO YIELD " X5 " GRAMS OF SILVER NITRATE? "
165 A(7)= (INT(10000*X5/Y1))/100
170 IF Z<>8 THEN 180 ELSE PRINT " CALCULATE THE WEIGHT OF ANHYDROUS HCl IN " X5 "
 ml OF CONCENTRATED "
171 PRINT " HYDROCHLORIC ACID OF DENSITY 1.19g/ml AND CONTAINING "Y1"% HCl"
172 PRINT " BY WEIGHT. "
175 A(8)= (INT(X5*1.19*Y1))/100
180 IF Z<>9 THEN 200 ELSE PRINT " WHAT IS THE MOLALITY OF A SOLUTION WHICH CONTAI
NS "X6 "g OF CANE"
181 PRINT " SUGAR, C  H  O  , DISSOLVED IN " X1 " GRAMS OF WATER? "
182 PRINT "         12 22 11 "
185 A(9)= (INT(1000*X6/(342*X1)))/1000
200 IF Z<>10 THEN 210 ELSE PRINT " CALCULATE THE VOLUME OF CONCENTRATED SULFURIC
ACID, OF DENSITY 1.84g/ml"
201 PRINT " AND CONTAINING "Y2"% OF SULFURIC ACID BY WEIGHT, THAT WOULD CONTAIN "
202 PRINT  X5 " GRAMS OF PURE SULFURIC ACID. "
205 A(10) =(INT(10000*X5/(Y1*1.84)))/100
210 IF Z<>11 THEN 220 ELSE PRINT " CALCULATE THE PERCENT OF THE SOLUTE IN A SOLUT
ION THAT CONTAINS "Y1"g"
211 PRINT " OF POTASSIUM CARBONATE IN "X2"g OF WATER. "
215 A(11)= (INT(10000*Y1/X2))/100
220 IF Z<>12 THEN 230 ELSE PRINT " CALCULATE THE GRAMS OF WATER THAT MUST BE ADDE
D TO " X5" GRAMS OF "
221 PRINT " POTASSIUM IODIDE IN THE PREPARATION OF A " Y1 " PERCENT POTASSIUM "
222 PRINT " IODIDE SOLUTION. "
225 A(12)= (INT(X5*100*(100-Y1)/Y1))/100
230 IF Z<>13 THEN 240 ELSE PRINT " CALCULATE THE MOLALITY OF A SOLUTION CONTAININ
G "X5"g OF SULFURIC"
231 PRINT " ACID IN " X1 "g OF WATER. "
235 A(13)= (INT(100000*X5/(98*X1)))/100
240 IF Z<>14 THEN 250 ELSE PRINT " HOW MANY GRAMS OF SOLUTE ARE NEEDED TO PREPARE
 " X2 "g OF A "
241 PRINT Y1/100 " MOLAL SOLUTION OF ETHYLENE GLYCOL (C H O )? "
242 PRINT "                                                  2 6 2 "
245 A(14)= (INT(62*Y1*X2/(1000+62*Y1)))/100
250 IF Z<> 15 THEN 260 ELSE PRINT " CALCULATE THE NUMBER OF GRAMS OF WATER THAT M
UST BE ADDED TO "Y1/25
251 PRINT " MOLES OF PRESTONE (C H O ) IN THE PREPARATION OF A " Y2"m SOLUTION."
252 PRINT "                          2 6 2 "
255 A(15)= (INT(100000*Y1/(25*Y2)))/100
260 PRINT\IF  N%=1 THEN 1999
261 INPUT "           YOUR ANSWER ------------> ";B(Z)
265 IF ABS(A(Z)-B(Z))>.1 THEN 399 ELSE 499
399 PRINT
400 C1=C1+1\IF C1=1 THEN PRINT "  YOU ARE INCORRECT. TRY AGAIN. " ELSE PRINT "  Y
OU ARE WRONG AGAIN.  THE CORRECT ANSWER IS ---------->" A(Z);
401 IF C1=1 THEN 260
402 IF Z=2 THEN PRINT "%" ELSE IF Z=4 THEN PRINT"MOLAL" ELSE IF Z=9 THEN PRINT"MO
LAL" ELSE IF Z=10 THEN PRINT "ml" ELSE IF Z=13 THEN PRINT "MOLAL" ELSE IF Z=11 TH
EN PRINT"%" ELSE PRINT"GRAMS"
403 PRINT
405 IF C1=1 THEN 100 ELSE 1999
499 PRINT
500 PRINT "          CORRECT !!!!! "\S1%=S1%+1%
1999 C1=0\IF Z=5 THEN 2010 ELSE IF Z=10 THEN 2010
2000 NEXT Z
2009 IF Z = 15 THEN 2480
2010 PRINT\PRINT\PRINT " IF YOU WISH TO STOP HERE, TYPE 'N', OTHERWISE, PRESS 'RE
TURN'. ";
2012 INPUT Q$
2014 IF Q$="N" THEN 2480 ELSE 2000
2480 PRINT\PRINT\PRINT
2481 PRINT "     " A5$ " HAS ENDED THIS SESSION. "A5$ " HAS ANSWERED "S1%" QUESTI
ONS CORRECTLY. "
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2485 PRINT\PRINT\PRINT " HERE ARE " A5$ "'S ANSWERS AND THE CORRECT ANSWERS. "
2486 PRINT\PRINT
2500 PRINT TAB(8) "PROBLEM";TAB(28) "CORRECT ANSWER";TAB(58) "STUDENT'S ANSWER"
2501 PRINT TAB(8) "*******";TAB(28) "******* ******";TAB(58) "********* ******"\P
RINT\PRINT
2505 FOR Z=1 TO 15
2506 IF Z<10 THEN PRINT TAB (11)''Z;
2507 IF Z>9 THEN PRINT TAB(10)''Z;
2510 PRINT TAB(31)''A(Z);TAB(65)''B(Z)
2511 NEXT Z
3000 END
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CHE018  14:53            19-Apr-77
1 REM _ THIS IS A PRACTICE SESSION IN SOLUTIONS. >>>>>>>>>>>>>>>
2 ! THIS PROGRAM HAS BEEN DEVELOPED BY DR. JULIO GALLARDO, OF HOSTOS COMMUNITY
    COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCIENCE FOUNDATION.
10 INPUT "     CODE # "; Q%\PRINT\PRINT
11 IF Q%=1 THEN 45
15 INPUT "     AFTER THE QUESTION MARK (?), TYPE YOUR NAME. "; A1$
16 PRINT
17 INPUT  "     AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER. ";
A2$
18 PRINT\PRINT "     YOUR NAME IS, "A1$" AND YOUR SOCIAL SECURITY NUMBER IS,"
19 PRINT \PRINT"     " A2$". ARE THEY CORRECT? "\PRINT
20 INPUT "     TYPE 'Y' FOR YES AND 'N' FOR NO "; A3$
21 PRINT\IF A3$="N" THEN 15 ELSE IF A3$="Y" THEN 50
22 PRINT\PRINT "     TYPE 'Y' OR 'N' ONLY. "\PRINT\GOTO 20
45 DIM A(15),B(15)
50 FOR Z%=1 TO 15
51 RANDOMIZE
53 PRINT\PRINT
54 IF Z%<10% THEN PRINT "          *******  * " ELSE PRINT "          *******  **
 "
55  PRINT "          PROBLEM " Z%
56 IF Z%<10% THEN PRINT "          *******  * " ELSE PRINT "          *******  **
 "
57 PRINT \ PRINT
60 V1=(INT(40050*RND+30500))/100\V2=(INT(40555*RND+29555))/100
61 ! V1 AND V2 ARE VOLUMES WITH VALUES BETWEEN 300 AND 700
    TO BE USED IN ml
62 V3=(INT(225*RND+150))/100\V4=(INT(225*RND+145))/100
63 ! V3 AND V4 ARE VOLUMES BETWEEN 1.50 AND 3.75 WITH
    TWO DECIMALS. TO BE USED WITH LITERS
65 M1=(INT(3055*RND+2055))/100\M2=(INT(3145*RND+2155))/100
66 ! M1 AND M2 ARE MASSES WITH VALUES BETWEEN 20 AND 50 WITH
    TWO DECIMALS
68 N1=(INT(1735*RND+15))/1000\N2=(INT(1725*RND+18))/1000
69 ! N1 AND N2 ARE VALUES OF NORMALITY BETWEEN .015 AND 1.75
    WITH THREE DECIMALS.
70 P1=INT(30*RND+15)\P2=INT(45*RND+50)
71 ! P1% AND P2% ARE INTEGERS TO BE USED AS PERCENTS. P1 <45 AND P2 >50
73 M3=(INT(100*RND*49+100*50))/100\M4=(INT(100*RND*45+4500))/100
74 ! M3 AND M4 ARE MASSES  WITH VALUES BETWEEN 50 AND 99 AND WITH TWO DECIMALS
75 N3=INT(8*RND+1)
76 ! N3 IS A NUMBER BETWEEN 1 AND 3 (INTEGER)
100 IF Z%<>1 THEN 110 ELSE PRINT " CALCULATE THE MOLARITY OF A SOLUTION WHICH CON
TAINS" M3 " g OF ETHYL"
101 PRINT " ALCOHOL (C H O) IN" V1 " ml OF SOLUTION."
102 PRINT TAB(11)"2";TAB(13)"6"
105 A(1%)=(INT(100000*M3/(46*V1)))/100
110 IF Z%<> 2 THEN 120 ELSE PRINT " CALCULATE THE NORMALITY OF A SOLUTION WHICH C
ONTAINS" M1 " g OF SODIUM "
111 PRINT " CARBONATE (Na CO ) PER LITER."
112 PRINT TAB(14)"2"; TAB(17)"3"
115 A(2%)=(INT(M1*100/53))/100
120 IF Z%<>3 THEN 130 ELSE PRINT " HOW MANY MILLI-EQUIVALENTS OF SOLUTE ARE PRESE
NT IN" V2 " ml OF A" N3 " N "
121 PRINT" SOLUTION?"
125 A(3%)=(INT(N3*V2*100))/100
130 IF Z%<>4 THEN 140 ELSE PRINT " HOW MANY GRAMS OF SOLUTE ARE REQUIRED TO PREPA
RE " V4 "1 OF A" N2
131 PRINT " N SOLUTION OF PHOSPHORIC ACID (H PO )?"
132 PRINT TAB(33)"3";TAB(36)"4"
135 A(4%)=(INT(N2*V4*9800/3))/100
140 IF Z%<>5 THEN 150 ELSE PRINT " HOW MANY MILLI-EQUIVALENTS ARE THERE IN" V1 "m
l OF A" N1 "N SOLUTION OF
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141 PRINT " BARIUM HYDROXIDE (Ba(OH) )?"
142 PRINT TAB(25)"2"
145 A(5%)=(INT(N1*V1*100))/100
150 IF Z%<> 6 THEN 160 ELSE PRINT " WHAT IS THE EQUIVALENT WEIGHT OF ALUMINUM HYD
ROXIDE (Al(OH) ), WHERE "
151 PRINT TAB(60)"3"
152  PRINT " ONLY ONE OF THE HYDROXIDE IONS REACT? "
155 A(6%)=78
160 IF Z%<>7 THEN 170 ELSE PRINT " CALCULATE THE MOLARITY OF A"P1 " % CALCIUM NIT
RATE (Ca(NO ) ) SOLUTION"
161 PRINT TAB(57)"3";TAB (59)"2"
162 PRINT " WITH A DENSITY OF" N1 "g/ml."
165 A(7%)=(INT(100*P1*N1/164))/100
170  IF Z%<>8 THEN 180 ELSE PRINT " CALCULATE THE NORMALITY OF A SOLUTION CONTAIN
ING" M2 " G OF SODIUM"
171 PRINT " HYDROXIDE (NaOH) IN" V2 " ml OF SOLUTION."
175 A(8%)=(INT(M2*100000/V2))/100
180  IF Z%<>9 THEN 190 ELSE PRINT " CALCULATE THE MOLARITY OF A SULFURIC ACID SOL
UTION OF SPECIFIC GRAVITY"
181 PRINT N2 " g/ml CONTAINING" P1 " % H SO  BY WEIGHT."
182 PRINT TAB(30)"2";TAB(33)"4"
185 A(9%)=(INT(1000*N2*P1/98))/100
190 IF Z%<>10 THEN 200 ELSE PRINT " HOW MANY EQUIVALENTS OF SOLUTE ARE CONTAINED
IN" V4 " l  OF A" N3 " N"
191 PRINT " SOLUTION
195 A(10%)=(INT(100*N3*V4))/100
200 IF Z%<>11 THEN 210 ELSE PRINT " HOW MANY MILLILITERS OF CONCENTRATED SULFURIC
 ACID (H SO ), OF SPECIFIC"
201 PRINT TAB(54)"2";TAB(57)"4"
202 PRINT " GRAVITY 1.84 CONTAINING 98% SULFURIC ACID BY WEIGHT SHOULD BE TAKEN"
203  PRINT " TO MAKE" V1 " ml OF" N1 " N SOLUTION?"
205 A(11%)=(INT(N1*V1/36.8))/100
210 IF Z%<>12 THEN 220 ELSE PRINT " CALCULATE THE NORMALITY OF A" N2 " M PHOSPHOR
IC ACID (H PO ) SOLUTION "
211 PRINT TAB(56)"3";TAB(59)"4"
212 PRINT " IN A REACTION THAT ONLY REPLACES TWO HYDROGEN IONS. "
215 A(12%)=(INT(N2*300/2))/100
220 IF Z%<>13 THEN 230 ELSE PRINT " CALCULATE THE NUMBER OF GRAMS OF SOLUTE NECES
SARY TO PREPARE" V2 " ml "
221 PRINT " OF A" N2 " M SODIUM SULFATE (Na SO ) SOLUTION. "
222 PRINT TAB(33)"2";TAB(36)"4"
225 A(13%)=(INT(N2*V2*142/10))/100
230 IF Z%<>14 THEN 240 ELSE PRINT " CALCULATE THE NUMBER OF ml OF SOLUTION REQUIR
ED TO PROVIDE" M4 " g OF"
231 PRINT " SULFURIC ACID (H SO ) FROM A" N3 " N SOLUTION IN A REACTION THAT REPL
ACES"
232 PRINT TAB(17)"2";TAB(20)"4"
233 PRINT " ONLY ONE HYDROGEN ION."
235 A(14%)=(INT(M4*100000/(98*N3)))/100
240 IF Z%<>15 THEN 250 ELSE PRINT " A HYDROCHLORIC ACID SOLUTION IS APPROXIMATELY
" P1 " % HYDROCHLORIC ACID (HCl)"
241 PRINT " AND ITS DENSITY IS" N1 " g/ml. CALCULATE THE NORMALITY OF THE HYDROCH
LORIC "
242 PRINT " ACID."
245 A(15%)=(INT(1000*P1*N1/36.45))/100
250 IF Q%=1 THEN1999
300 PRINT\INPUT "     YOUR ANSWER ----------> ";B(Z%)
305 PRINT\IF ABS(A(Z%)-B(Z%))>.1 THEN 399 ELSE 499
399 PRINT
400 C1=C1+1\IF C1=1 THEN PRINT "     YOU ARE INCORRECT. TRY AGAIN. " ELSE PRINT "
     YOU ARE WRONG AGAIN. THE CORRECT ANSWER IS ----------> " A(Z%);
401 IF C1=1 THEN 300
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402 IF Z%=1 THEN PRINT" M" ELSE IF Z%=2 THEN PRINT " N" ELSE IF Z%=3 THEN PRINT"
m-EQUIV." ELSE IF Z%=4 THEN PRINT " ≤" ELSE IF Z%=5 THEN PRINT " m-EQUIV." ELSE 4
03
403 IF Z%=6 THEN PRINT " ≤" ELSE IF Z%=7 THEN PRINT " M" ELSE IF Z%=8 THEN PRINT
" N" ELSE IF Z%=9 THEN PRINT " M" ELSE IF Z%=10 THEN PRINT " EQUIV." ELSE IF Z%=1
1 THEN PRINT " m1" else 404
404 IF Z%=12 THEN PRINT " N" ELSE IF Z%=13 THEN PRINT " ≤" ELSE IF Z%=14 THEN PRI
NT " m1" ELSE IF Z%=15 THEN PRINT " N"
405 PRINT\PRINT\GOTO 1999
499 PRINT
500 PRINT "          CORRECT !!! "\S1%=S1%+1%
1999 C1=0\IF Z%=5 THEN 2010 ELSE IF Z%=10 THEN 2010 ELSE IF Z%=15 THEN 2010 ELSE
IF Z%=20 THEN 2010
2000 NEXT Z%
2009 IF Z%=15 THEN 2480
2010 PRINT\PRINT\PRINT "     IF YOU WISH TO STOP HERE, TYPE 'Y', OTHERWISE PRESS
'RETURN'. ";
2012  INPUT Q$
2014 IF Q$="Y" THEN 2480 ELSE 2000
2480 PRINT\PRINT\PRINT
2481 PRINT "     "A1$ " HAS ENDED THIS SESSION. " A1$ " HAS ANSWERED "S1% " QUEST
IONS CORRECTLY. "
2485 PRINT\PRINT\PRINT "     HERE ARE THE CORRECT ANSWERS AND "A1$ "'S ANSWERS. "
2486 PRINT\PRINT
2500 PRINT TAB(8) "PROBLEM";TAB(28) "CORRECT ANSWER";TAB(58) "STUDENT'S ANSWER"
2501 PRINT TAB(8) "*******";TAB(28) "******* ******";TAB(58) "********** ******"\P
RINT\PRINT\PRINT
2505 FOR J%=1% TO Z%
2506 IF J%<10% THEN PRINT TAB(11)''J%;
2507 IF J%>9% THEN PRINT TAB(10)''J%;
2510 PRINT TAB(31)''A(J%);TAB(65)''B(J%)
2511 NEXT J%
3000 END

Ready
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CHE028  10:16          20-Apr-77
1 REM -  THIS IS A PRACTICE SESSION IN GAS LAWS. >>>>>>>>>>>>>>>>
2 ! THIS PROGRAM HAS BEEN DEVELOPED BY DR. JULIO GALLARDO AND MR. STEVEN DELGADO,
 OF HOSTOS COMMUNITY COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCI
ENCE FOUNDATION.
3 PRINT\PRINT\PRINT\PRINT " IF YOU WISH TO GO TO A MORE DIFFICULT SET OF PROBLEMS
 (GEN. CHEM.),  TYPE "\PRINT " THE LETTER 'H' OTHERWISE PRESS THE <RETURN> KEY.";
4 INPUT S7$\IF S7$="H" THEN CHAIN "CHE038" ELSE 5\PRINT\PRINT
5 PRINT\PRINT\PRINT \ INPUT "          CODE # "; N%\PRINT\PRINT\PRINT
6 ! N%=1 WILL GIVE A PRINT OUT OF THE PROBLEMS WITH ANSWERS
7 IF N%=1 THEN 49
8 ! N1$ WILL BE THE STUDENT'S NAME WHILE S1$ WILL BE HIS SOCIAL SECURITY NUMBER
11 DIM A(10),B(10)
12 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME.  ";N1$
13 PRINT
14 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER.  " ; S1
$
15 PRINT
20 PRINT " YOUR NAME IS, "N1$ " AND YOUR SOCIAL SECURITY NUMBER "\PRINT
21 PRINT " IS, " S1$ ". ARE THEY CORRECT?  TYPE 'YES' OR 'NO'. ";
22 INPUT S2$\ PRINT
25 IF S2$ = 'NO' THEN 12 ELSE IF S2$ <> 'YES' THEN PRINT " TYPE 'YES' OR 'NO' ONL
Y!!!" ELSE IF S2$='YES' THEN 27\PRINT
26 IF S2$<>'YES' THEN 15
27 PRINT\PRINT\PRINT\PRINT "          " N1$ " HAS STARTED THIS SESSION AT " TIM
E$(0)
49 Z1 = 1
50 RANDOMIZE
52 FOR Z=Z1 TO 10
55 T1=(INT(1000*RND +500))/10\T2=(INT(1000*RND +400))/10
56 ! T1 AND T2 ARE TEMPERATURES WITH VALUES BETWEEN 50 AND 150 DEGREES
58 P1=(INT(7050*RND+5500))/10\P2=(INT(8050*RND+4050))/10\P3=(INT(7000*RND+8000))/
10\M1=(INT(1845*RND+155))/1000\M2=(INT(1845*RND+155))/1000
59 ! P1,P2,P3 ARE VALUES OF PRESSURE BETWEEN 400 AND 1500
60 P4=(INT(40*RND+15))/10\P5=(INT(43*RND+16))/10
61 ! P4 AND P5 ARE VALUES OF PRESSURE IN ATM
62 V1=(INT(10000*RND+2000))/10\V2=(INT(10000*RND+2000))/10
63! V1 AND V2 ARE VALUES OF VOLUME IN MILLILITERS AND V3 IN LITERS
64  V3=(INT(75*RND+15))/10\V4=(INT(400*RND+100))/10
67 PRINT\PRINT\PRINT
68 Z9=Z9+1\FOR I=30 TO 49\PRINT TAB(I) "*";\NEXT I
69 PRINT TAB(50) "*"\IF Z9=2 THEN 80 ELSE PRINT TAB(30) "*";\PRINT TAB(35) "PROBL
EM " Z;\PRINT TAB(50) "*"\GOTO 68
80 DEF FNC(T1)=(5*(T1-32))/9
81 DEF FNB(T1)=9*T1/5 +32
85 A9$= "          CORRECT !!!!! "
87 B2$= "     YOU ARE INCORRECT. TRY AGAIN"
88 B3$="  YOU ARE WRONG AGAIN. THE CORRECT ANSWER IS ---------->  "
99 PRINT\PRINT
100 IF Z<>1 THEN 105 ELSE PRINT " A MASS OF OXYGEN OCCUPIES" V3 "LITERS UNDER A P
RESSURE OF" P3 "TORR. "
101 PRINT " DETERMINE THE VOLUME OF THE SAME MASS OF GAS AT STANDARD PRESSURE (76
0 TORR),"
102 PRINT " THE TEMPERATURE REMAINING CONSTANT. "
103 A(1)=(INT(V3*P3/7.6))/100
105 IF Z<>2 THEN 110 ELSE PRINT " GIVEN THE VOLUME OF A GAS AS" V1 "ml AT"P2 "TOR
R PRESSURE, "
106 PRINT " CALCULATE THE VOLUME OF THE SAME MASS OF GAS AT" P1 "TORR. "
108 A(2)=(INT(100*V1*P2/P1))/100
110 IF Z<>3 THEN 115 ELSE PRINT " A MASS OF NEON OCCUPIES" V2 "ml AT" T1 "C. FIND
 ITS VOLUME AT" T2 "C,"
111 PRINT " THE PRESSURE REMAINING CONSTANT. "
113 A(3)=(INT(100*V2*(T2+273)/(T1+273)))/10^
```

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115 IF Z<>4 THEN 120 ELSE PRINT " WHAT VOLUME WILL" V3 "LITERS OF HELIUM, MEASURE
D AT"T2 "C, OCCUPY"
116 PRINT " AT" T1 "C ? "
118 A(4)=(INT(100*V3*(T1+273)/(T2+273)))/100
120 IF Z<>5 THEN 125 ELSE PRINT " A STEEL TANK CONTAINS CARBON DIOXIDE AT" T1 "C
AND A PRESSURE OF" P4 "ATM."
121 PRINT " DETERMINE THE INTERNAL GAS PRESSURE WHEN THE TANK IS HEATED TO"T2 "C.
"
122  A(5)=(INT(100*P4*(T2+273)/(T1+273)))/100
125 IF Z<>6 THEN 130 ELSE PRINT " GIVEN" V3 "LITERS OF AMMONIA AT" T1 "C AND" P1
"TORR, DETERMINE ITS"
126 PRINT " VOLUME AT" T2 "C AND" P3 "TORR. "
127 A(6)=(INT(100*V3*((T2+273)/(T1+273))*(P1/P3)))/100
130 IF Z<>7 THEN 135 ELSE PRINT " THE VOLUME OF A QUANTITY OF SULFUR DIOXIDE AT"
T1 "C AND" P3 "TORR, IS"
131 PRINT "" V3 "LITERS. CALCULATE ITS VOLUME AT STANDART CONDITIONS (STP). "
133 A(7)=(INT(100*V3*(273/(T1+273))*((P3/760))))/100
135 IF Z<>8 THEN 140 ELSE PRINT " A MASS OF HYDROGEN OCCUPIES" V4 "LITERS AT" T2
"F AND" P5 "ATM. FIND ITS"
136 PRINT " VOLUME AT -" T1 "F AND" P4 "ATM. "
137 C(8)=V4*P5*100*(FNC(-T1)+273)\D(8)=(FNC(T2)+273)*P4
138 A(8) =(INT(C(8)/D(8)))/100
140 IF Z<>9 THEN 145 ELSE PRINT " TO HOW MANY ATMOSPHERES PRESSURE MUST A LITER O
F GAS MEASURED AT" P4 "ATM"
141 PRINT " AND" T2 "C BE SUBJECT TO BE COMPRESSED TO 1/2 LITER WHEN THE TEMPERAT
URE"
142 PRINT " IS" T1 "C?"
144 A(9)=(INT(100*P4*(1/.5)*((T2+273)/(T1+273))))/100
145 IF Z<>10 THEN 499 ELSE PRINT " A GIVEN SAMPLE OF A GAS HAS A VOLUME OF" V4 "L
ITERS AT" T1 "C AND" P2
146 PRINT " TORR. ITS VOLUME AND TEMPERATURE ARE CHANGED TO" V3 "LITERS AND" T2 "
C,"
147 PRINT " RESPECTIVELY. CALCULATE THE PRESSURE AT THIS CONDITIONS. "
149 A(10)=(INT(100*P2*V4*(T2+273)/(T1+273)*V3))/100
499 PRINT\PRINT
500 Z9=0\IF N%=1 THEN 1999
501PRINT
502 INPUT "           YOUR ANSWER ---------->";B(Z)
503 PRINT
505 IF (ABS(A(Z)-B(Z)))>.01 THEN 600 ELSE PRINT A9$\S1=S1+1
506 GOTO 1999
507 ! S1 COUNTS CORRECT ANSWERS
600 C1=C1+1\IF C1=1 THEN PRINT B2$ ELSE PRINT B3$;
605 IF C1=1 THEN 501 ELSE PRINT A(Z);
606 IF Z=2 THEN PRINT "ml" ELSE IF Z=3 THEN PRINT "ml" ELSE IF Z=5 THEN PRINT "AT
M" ELSE IF Z=9 THEN PRINT "ATM" ELSE IF Z=10 THEN PRINT "TORR" ELSE PRINT "liters
"
1999 Z1=Z1+1\PRINT\IF Z1=6 THEN 2019 ELSE IF Z1=11 THEN 2016
2014 IF Z>9 THEN 2400
2015 C1=0\NEXT Z
2016 PRINT\PRINT\PRINT\PRINT " IF YOU WISH TO CONTINUE TO HARDER PROBLEMS TYPE 'Y
ES' OTHERWISE 'NO'.";
20 17 INPUT S6$
2018 PRINT\PRINT\ IF S6$="NO" THEN 2400 ELSE 2498
2019 PRINT
2020 PRINT " IF YOU WISH TO CONTINUE TYPE 'YES', OTHERWISE TYPE 'NO'.";
2021  INPUT S5$
2022 PRINT\PRINT\PRINT
2025 IF S5$="NO" THEN 2400 ELSE 2015
2400 PRINT "      "N1$ " HAS ENDED THIS SESSION AT " TIME$(0)". "N1$
2401 PRINT\PRINT " HAS ANSWERED " S1 " QUESTIONS CORRECTLY. "\PRINT
2405 PRINT " HERE ARE THE CORRECT ANSWERS AND "N1$ "'S ANSWERS: "
2498 PRINT\PRINT\PRINT
2499 PRINT TAB(5) "******* ";TAB(18) " ********** ";TAB(40) "**********
```

```
2500 PRINT TAB(5) "PROBLEM ";TAB(18) " CORRECT ANSWER";TAB(40) "STUDENT'S ANSWER"
2501 PRINT TAB(5) "******* ";TAB(18) " ************** ";TAB(40) "****************
"
2505 PRINT\PRINT
2510 FOR Z=1 TO 10
2512 IF Z<10 THEN PRINT TAB(7) ''Z; ELSE PRINT TAB(6)''Z;
2513 PRINT TAB(24)'' A(Z); TAB(45)'' B(Z)
2520 NEXT Z
2530  IF S6$="YES" THEN CHAIN"CHE038" ELSE 3000
3000 END
```

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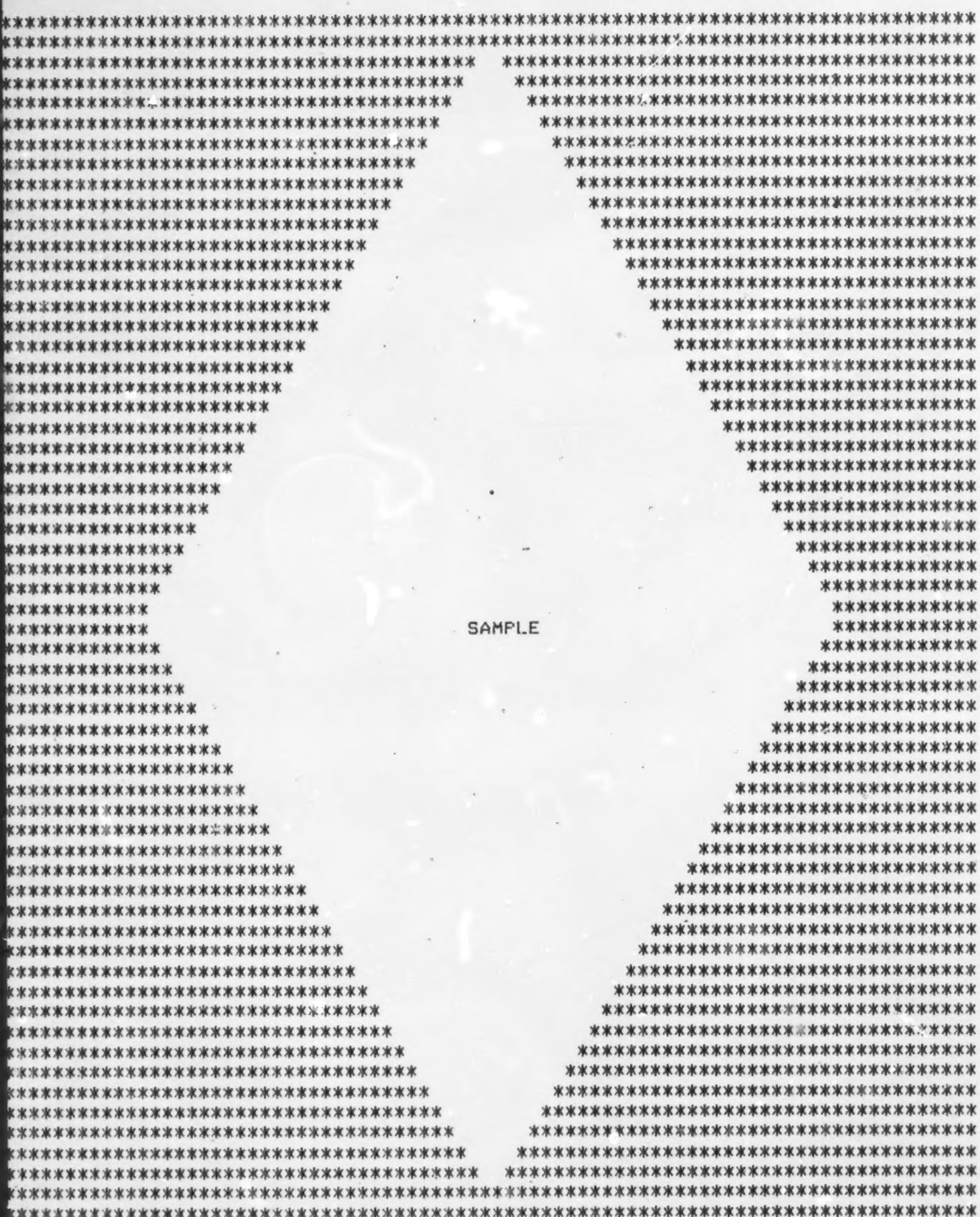
CHE038  12:36            20-Apr-77
1 REM - THIS IS A MORE DIFFICULT PRACTICE SESSION IN GAS LAWS.
2 ! THIS PROGRAM HAS BEEN DEVELOPED BY DR. JULIO GALLARDO, OF HOSTOS COMMUNITY
   COLLEGE, AND WAS SUBSIDIZED BY A GRANT FROM THE NATIONAL SCIENCE FOUNDATION.
3 PRINT\PRINT\PRINT
5 INPUT "          CODE # "; N%
6 ! N%=1 WILL GIVE A PRINT OUT OF THE PROBLEMS WITH ANSWERS
7 PRINT\PRINT\ IF N%=1 THEN49
8 ! N1$ WILL BE THE STUDENT'S NAME WHILE S1$ WILL BE HIS SOCIAL SECURITY NUMBER
11  DIM A(15),B(15)
12 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR NAME.  ";N1$
13 PRINT
14 INPUT " AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER.  " ; S1
$
15 PRINT
20 PRINT " YOUR NAME IS, "N1$ " AND YOUR SOCIAL SECURITY NUMBER "\PRINT
21 PRINT " IS, " S1$ ". ARE THEY CORRECT?  TYPE 'YES' OR 'NO'. ";
22 INPUT S2$
25 PRINT\PRINT\IF S2$="NO" THEN 12 ELSE IF S2$<>'YES'  THEN PRINT "     TYPE 'YES
' OR 'NO' ONLY!!!! " ELSE 27
26 PRINT\PRINT\GOTO 20
27 PRINT\PRINT\PRINT "     "N1$ " HAS STARTED THIS SESSION AT " TIME$(0)
49 Z1=11
50 RANDOMIZE
52 FOR Z = Z1 TO 15
55 T1=(INT(1000*RND +500))/10\T2=(INT(1000*RND +400))/10
56 ! T1 AND T2 ARE TEMPERATURES WITH VALUES BETWEEN 50 AND 150 DEGREES
58 P1=(INT(7050*RND+5500))/10\P2=(INT(8050*RND+4050))/10\P3=(INT(7000*RND+8000))/
10\M1=(INT(1845*RND+155))/1000\M2=(INT(1845*RND+155))/1000
59 ! P1,P2,P3 ARE VALUES OF PRESSURE BETWEEN 400 AND 1500
60 P4=(INT(40*RND+15))/10\P5=(INT(43*RND+16))/10
61 ! P4 AND P5 ARE VALUES OF PRESSURE IN ATM
62 V1=(INT(10000*RND+2000))/10\V2=(INT(10000*RND+2000))/10
63! V1 AND V2 ARE VALUES OF VOLUME IN MILLILITERS AND V3 IN LITERS
64  V3=(INT(75*RND+15))/10\V4=(INT(400*RND+100))/10
67 PRINT\PRINT
68 Z9=Z9+1\FOR I=30 TO 49\PRINT TAB(I) "*";\NEXT I
69 PRINT TAB(50) "*"\IF Z9=2 THEN 80 ELSE PRINT TAB(30) "*";\PRINT TAB(35) "PROBL
EM " Z;\PRINT TAB(50) "*"\GOTO 68
80 DEF FNC(T1)=(5*(T1-32))/9
81 DEF FNB(T1)=9*T1/5 +32
85 A9$= "          CORRECT !!!!! "
87 B2$= "     YOU ARE INCORRECT. TRY AGAIN"
88 B3$="  YOU ARE WRONG AGAIN. THE CORRECT ANSWER IS ---------->  "
99 PRINT\PRINT
150 IF Z<>11 THEN 155 ELSE PRINT " AN IDLING, UNTUNED CAR ENGINE CAN PRODUCE" V2
"l/min OF EXHAUST AT" T1 "C"
151 PRINT " THAT CONTAINS" V3 "% BY VOLUME OF CARBON MONOXIDE (CO). HOW MANY MOLE
S OF CO"
152 PRINT " DOES THE EXHAUST DELIVER PER MINUTE (R=0.082 l-atm/mole/deg)."
154 A(11) = (INT(1219.512*V2*V3/(273+T1)))/100
155 IF Z<>12 THEN 160 ELSE PRINT " ASSUME THAT YOUR LUNGS CAN HOLD ABOUT" V2 "ml
OF AIR AT STP. IF YOU TAKE A"
156 PRINT " DEEP BREATH AND HOLD IT, THEN DIVE INTO THE OCEAN TO A DEPTH AT WHICH
 THE"
157 PRINT " TEMPERATURE IS" T1 "C AND THE PRESSURE IS" P3 "TORR, WHAT WILL BE THE
"\PRINT " VOLUME OF AIR IN YOUR LUNGS? "
158  A(12)=(INT(V2*(T1+273)*278.39/P3))/100
160 IF Z<>13 THEN 165 ELSE PRINT " IF" V2 "ml OF A GAS MEASURED AT" T2 "C AND" P3
 "TORR HAS A MASS OF"M1
161 PRINT "g, WHAT IS ITS MOLECULAR MASS? "
163 A(13)=(INT(M1*6232*1000*(T2+273)/(V2*P3)))/100
```

```
165 IF Z<>14 THEN 170 ELSE PRINT " CALCULATE THE DENSITY OF METHANE (CH ) AT -" T
1 "C AND" P1 "TORR."
166 PRINT  TAB(37) "4"
167 A(14)=(INT(25.67*P1/(273-T1)))/100
170 IF Z<>15 THEN 500 ELSE PRINT " HALOTHANE IS A NONFLAMMABLE, NONIRRITATING, GE
NERAL ANESTHETIC, AND IN"
171 PRINT" MANY INSTANCES IS SUPERIOR TO ETHYL ETHER. AT" T1 "C AND"P1 "TORR," M1
172 PRINT " g OF THE GAS OCCUPIES A VOLUME OF"V1 "ml. ITS COMPOSITION IS 12.2% CA
RBON,"
173 PRINT " 0.5% HYDROGEN, 40.5% BROMINE, 18.0% CHLORINE, AND 28.9% FLOURINE. CAL
CULATE"
174 PRINT " THE MOLECULAR MASS FOR HALOTHANE. "
175 A(15)=(INT(M1*6232*1000*(T1+273)/(V1*P1)))/100
499 PRINT\PRINT
500 Z9=0\IF N%=1 THEN 1999
501PRINT
502 INPUT "          YOUR ANSWER ---------->";B(Z)
503 PRINT
505 IF (ABS(A(Z)-B(Z)))>.01 THEN 600 ELSE PRINT A9$\S1=S1+1
506 GOTO 1999
507 ! S1 COUNTS CORRECT ANSWERS
600 C1=C1+1\IF C1=1 THEN PRINT B2$ ELSE PRINT B3$;
605 IF C1=1 THEN 501 ELSE PRINT A(Z);
606 IF Z=11 THEN PRINT " moles " ELSE IF Z=12 THEN PRINT "ml " ELSE IF Z=13 THEN
PRINT " amu " ELSE IF Z=14 THEN PRINT " g/ml " ELSE IF Z=15 THEN PRINT " amu "
1999 Z1=Z1+1\PRINT\IF Z1=16 THEN 2400
2014 IF Z>14 THEN 2400
2015 C1=0\NEXT Z
2022 PRINT\PRINT\PRINT
2400 PRINT "     "N1$ " HAS ENDED THIS SESSION AT " TIME$(0)". "N1$
2401 PRINT\PRINT " HAS ANSWERED " S1 " QUESTIONS CORRECTLY. "\PRINT
2405 PRINT " HERE ARE THE CORRECT ANSWERS AND "N1$ "'S ANSWERS: "
2498 PRINT\PRINT\PRINT
2499 PRINT TAB(5) "******* ";TAB(18) " ************** ";TAB(40) "****************
 "
2500 PRINT TAB(5) "PROBLEM ";TAB(18) " CORRECT ANSWER";TAB(40) "STUDENT'S ANSWER"
2501 PRINT TAB(5) "******* ";TAB(18) " ************** ";TAB(40) "****************
"
2505 PRINT\PRINT
2510 FOR Z = 11 TO 15
2512 PRINT TAB(6)''Z;
2513 PRINT TAB(24)'' A(Z); TAB(45)'' B(Z)
2520 NEXT Z
30000 END
```


SAMPLE

```
CHE508  12:17            22-Apr-77
        CODE # ? 1

 HOW MANY PROBLEMS DO YOU WANT ? 3


              **********
              PROBLEM  1
              **********

 A BRASS BAR WEIGHING  39.45 LBS IS MADE OF  79.08 % ZINC AND THE BALANCE OF
COPPER. HOW MANY LBS. OF COPPER DOES IT CONTAIN?


              **********
              PROBLEM  2
              **********

 A TRUCK CARRYING  674.12  LBS OF COAL WEIGHED  1464.58  LBS.
WHAT PERCENT OF THE TOTAL WEIGHT WAS DUE TO THE WEIGHT OF THE TRUCK?


              **********
              PROBLEM  3
              **********

 HOW MANY SHEETS OF METAL 1/ 8  INCHES THICK ARE THERE IN A PILE  75.54  INCHES
HIGH?

 DO YOU WANT MORE PROBLEMS ? NO



  PROBLEM      CORRECT ANSWER      STUDENT ANSWER
  *******      **************      **************

      1            8.25294              0
      2            53.9718              0
      3            604.32               0
```

```
        CODE # ?

AFTER THE QUESTION MARK (?), TYPE YOUR NAME. ? JOHN DOE

AFTER THE QUESTION MARK (?), TYPE YOUR SOCIAL SECURITY NUMBER. ? 000001977

YOUR NAME IS, JOHN DOE, AND YOUR SOCIAL SECURITY NUMBER

IS, 000001977. ARE THEY CORRECT?  TYPE 'Y' FOR YES AND 'N' FOR NO. ? U

TYPE 'Y' OR 'N' ONLY !!!!!

YOUR NAME IS, JOHN DOE, AND YOUR SOCIAL SECURITY NUMBER

IS, 000001977. ARE THEY CORRECT?  TYPE 'Y' FOR YES AND 'N' FOR NO. ? Y

HOW MANY PROBLEMS DO YOU WANT ? 3


           **********
           PROBLEM  1
           **********


 A BRASS BAR WEIGHING  56.77 LBS IS MADE OF  48.74 % ZINC AND THE BALANCE OF
COPPER. HOW MANY LBS. OF COPPER DOES IT CONTAIN?

 YOUR ANSWER  ---------->  ? 29.10

        CORRECT!!!


           **********
           PROBLEM  2
           **********


 A TRUCK CARRYING  988.11  LBS OF COAL WEIGHED  1908.91  LBS.
WHAT PERCENT OF THE TOTAL WEIGHT WAS DUE TO THE WEIGHT OF THE TRUCK?

 YOUR ANSWER  ---------->  ? 4.8

 YOU ARE INCORRECT. TRY AGAIN.

 YOUR ANSWER  ---------->  ? 48

 YOU ARE WRONG AGAIN. THE CORRECT ANSWER IS -------->     48.24


           **********
           PROBLEM  3
           **********


 HOW MANY SHEETS OF METAL 1/ 1  INCHES THICK ARE THERE IN A PILE  62.58  INCHES
HIGH?
```

```
YOUR ANSWER  ----------->  ? 62.5
YOU ARE INCORRECT. TRY AGAIN.

YOUR ANSWER  ----------->  ? 62.58

          CORRECT!!!

DO YOU WANT MORE PROBLEMS ? NO

 THE STUDENT JOHN DOE, HAS ENDED THIS SESSION.
JOHN DOE, HAS ANSWERED  2 , QUESTIONS CORRECTLY.
 HERE ARE JOHN DOE'S ANSWERS AND THE CORRECT ANSWERS.


   PROBLEM      CORRECT ANSWER       STUDENT ANSWER
   *******      **************       **************

       1            29.1003              29.1
       2            48.237               48
       3            62.58                62.58


Ready
```